Class - XII
Multiple Choice Question Bank
[MCQ ] Term – I & Term- II

Computer Science [083]
Based on Latest CBSE Exam Pattern
for the Session 2021-22
MESSAGE FROM DIPUTY COMMISSIONER

It is a matter of great pleasure for me to publish study material for different subjects of classes X and XII for Raipur Region. Getting acquainted and familiarized with the recent changes in curriculum and assessment process made by CBSE vide Circular No. 51 and 53 issued in the month of July 2021 will help students to prepare themselves better for the examination. Sound and deeper knowledge of the Units and Chapters is must for grasping the concepts, understanding the questions. Study materials help in making suitable and effective notes for quick revision just before the examination.

Due to the unprecedented circumstances of COVID-19 pandemic the students and the teachers are getting very limited opportunity to interact face to face in the classes. In such a situation the supervised and especially prepared value points will help the students to develop their understanding and analytical skills together. The students will be benefitted immensely after going through the question bank and practice papers. The study materials will build a special bond and act as connecting link between the teachers and the students as both can undertake a guided and experiential learning simultaneously. It will help the students develop the habit of exploring and analyzing the Creative & Critical Thinking Skills. The new concepts introduced in the question pattern related to case study, reasoning and ascertain will empower the students to take independent decision on different situational problems. The different study materials are designed in such a manner to help the students in their self-learning pace. It emphasizes the great pedagogical dictum that ‘everything can be learnt but nothing can be taught’. The self-motivated learning as well as supervised classes will together help them achieve the new academic heights.

I would like to extend my sincere gratitude to all the principals and the teachers who have relentlessly striven for completion of the project of preparing study materials for all the subjects. Their enormous contribution in making this project successful is praiseworthy.

Happy learning and best of luck!

Vinod Kumar
(Deputy Commissioner)
Our Patorn

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KVS RO Raipur

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Assistant Commissioner
KVS RO Raipur

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Assistant Commissioner
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CLASS-XII
Code No. 083
2021-22

1. Prerequisites
   Computer Science- Class XI

2. Learning Outcomes
   Student should be able to
   a) apply the concept of function.
   b) explain and use the concept of file handling.
   c) use basic data structure: Stacks.
   d) explain basics of computer networks.
   e) use Database concepts, SQL along with connectivity between Python and SQL.

3. Distribution of Marks:

<table>
<thead>
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<th>Marks</th>
<th>Periods</th>
<th></th>
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<td>40</td>
<td>50</td>
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</tr>
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<td></td>
<td>Programming - 2</td>
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</tr>
<tr>
<td>II</td>
<td>Computer Networks</td>
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<tr>
<td>III</td>
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<td>20</td>
<td>20</td>
<td>15</td>
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<td>Total</td>
<td>70</td>
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<table>
<thead>
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<th>Unit Name</th>
<th>Term-1</th>
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<tr>
<td>II</td>
<td>Computer Networks</td>
<td>---</td>
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<tr>
<td>III</td>
<td>Database Management</td>
<td>---</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>35</td>
<td>35</td>
</tr>
</tbody>
</table>
4. Unit wise Syllabus

TERM 1:

Unit I: Computational Thinking and Programming – 2

- Revision of Python topics covered in Class XI.
- Functions: types of function (built-in functions, functions defined in module, user defined functions), creating user defined function, arguments and parameters, default parameters, positional parameters, function returning value(s), flow of execution, scope of a variable (global scope, local scope)
- Introduction to files, types of files (Text file, Binary file, CSV file), relative and absolute paths
- Text file: opening a text file, text file open modes (r, r+, w, w+, a, a+), closing a text file, opening a file using with clause, writing/appending data to a text file using write() and writelines(), reading from a text file using read(), readline() and readlines(), seek and tell methods, manipulation of data in a text file
- Binary file: basic operations on a binary file: open using file open modes (rb, rb+, wb, wb+, ab, ab+), close a binary file, import pickle module, dump() and load() method, read, write/create, search, append and update operations in a binary file
- CSV file: import csv module, open / close csv file, write into a csv file using csv.writerow() and read from a csv file using csv.reader()

TERM 2:

Unit I: Computational Thinking and Programming – 2

- Data Structure: Stack, operations on stack (push & pop), implementation of stack using list.

Unit II: Computer Networks

- Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET)
- Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching)
- Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves

- Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)
- Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree)
- Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP
- Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), domain names, URL, website, web browser, web servers, web hosting
Unit III: Database Management

- Database concepts: introduction to database concepts and its need
- Relational data model: relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key)
- Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command
- Aggregate functions (max, min, avg, sum, count), group by, having clause, joins: Cartesian product on two tables, equi-join and natural join
- Interface of python with an SQL database: connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using fetchone(), fetchall(), rowcount, creating database connectivity applications

5. Practical

<table>
<thead>
<tr>
<th>S.No</th>
<th>Marks (Total 30)</th>
<th>Term-1 (15 Marks)</th>
<th>Term-2 (15 Marks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Lab Test:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Python program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. 3 SQL Queries based on one/two table(s), 2 output questions based on SQL queries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Report file:</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Term – 1: Minimum 15 Python programs based on Term - 1 Syllabus</td>
<td></td>
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<tr>
<td></td>
<td>Term – 2:</td>
<td></td>
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<tr>
<td></td>
<td>Minimum 3 Python programs based on Term-2 Syllabus</td>
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<tr>
<td></td>
<td>SQL Queries – Minimum 5 sets using one table / two tables.</td>
<td></td>
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<tr>
<td></td>
<td>Minimum 2 programs based on Python - SQL connectivity.</td>
<td></td>
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</tr>
<tr>
<td>3</td>
<td>Project (using concepts learnt in Classes 11 and 12)</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Term – 1: Synopsis of the project to be submitted by the students (documentation only, may not submit the code during Term - 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Term - 2: Final coding + Viva voce (Student will be allowed to modify their Term 1 document and submit the final executable code.)</td>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>Viva voce</td>
<td>3</td>
<td>2</td>
</tr>
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</table>
6. Suggested Practical List:

Term-1

Python Programming
- Read a text file line by line and display each word separated by a #.
- Read a text file and display the number of vowels/consonants/uppercase/lowercase characters in the file.
- Remove all the lines that contain the character 'a' in a file and write it to another file.
- Create a binary file with name and roll number. Search for a given roll number and display the name, if not found display appropriate message.
- Create a binary file with roll number, name and marks. Input a roll number and update the marks.
- Write a random number generator that generates random numbers between 1 and 6 (simulates a dice).
- Create a CSV file by entering user-id and password, read and search the password for given user-id.

Term-2

Python Programming
- Write a Python program to implement a stack using list.

Database Management
- Create a student table and insert data. Implement the following SQL commands on the student table:
  - ALTER table to add new attributes / modify data type / drop attribute
  - UPDATE table to modify data
  - ORDER BY to display data in ascending / descending order
  - DELETE to remove tuple(s)
  - GROUP BY and find the min, max, sum, count and average
  - Joining of two tables.
- Similar exercise may be framed for other cases.
- Integrate SQL with Python by importing suitable module.

Database Management
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  - ALTER table to add new attributes / modify data type / drop attribute
  - UPDATE table to modify data
  - ORDER BY to display data in ascending / descending order
  - DELETE to remove tuple(s)
  - GROUP BY and find the min, max, sum, count and average
- Similar exercise may be framed for other cases.
- Integrate SQL with Python by importing suitable module.
7. Suggested Reading Material
   - NCERT Textbook for COMPUTER SCIENCE (Class XII)
   - Support Materials on the CBSE website.

8. Project

The aim of the class project is to create something that is tangible and useful using Python file handling/Python-SQL connectivity. This should be done in groups of two to three students and should be started by students at least 6 months before the submission deadline. The aim here is to find a real world problem that is worthwhile to solve.

Students are encouraged to visit local businesses and ask them about the problems that they are facing. For example, if a business is finding it hard to create invoices for filing GST claims, then students can do a project that takes the raw data (list of transactions), groups the transactions by category, accounts for the GST tax rates, and creates invoices in the appropriate format. Students can be extremely creative here. They can use a wide variety of Python libraries to create user friendly applications such as games, software for their school, software for their disabled fellow students, and mobile applications, of course to do some of these projects, some additional learning is required; this should be encouraged. Students should know how to teach themselves.

The students should be sensitised to avoid plagiarism and violations of copyright issues while working on projects. Teachers should take necessary measures for this.
TERM-1
KEY POINTS:

Introduction to Python

- **Python** is an open source, object oriented HLL developed by Guido van Rossum in 1991.
- **Tokens** - smallest individual unit of a python program.
- **Keyword** - Reserved word that can’t be used as an identifier.
- **Identifiers** - Names given to any variable, constant, function or module etc.

Classify the following into valid and invalid identifier

(i) Mybook (ii) Break (iii) _DK (iv) My_book (v) PaidIntrest (vi) s-num
(vii) percent (viii) 123 (ix) dit km (x) class

Ans: (i) valid (ii) invalid (iii) Valid (iv) valid (v) valid (vi) invalid (‘-‘) is not allowed
(vii) valid (viii) invalid (First Character must be alphabet) (ix) invalid (no space is allowed) (x) invalid (class is a keyword)

- **Literals** - A fixed numeric or non-numeric value.
- **Variable** - A variable is like a container that stores values to be used in program.
- **String** - The text enclosed in quotes.
- **Comment** - Comments are non-executable statement begin with # sign.
- **Docstring** - Comments enclosed in triple quotes (single or double).
- **Operator** – performs some action on data

  - Arithmetic (+, -, *, /, %, **, //)
  - Relational/comparison (<, >, <=, >=, =, !=).
  - Assignment (=, /=, +=, -=, *=, %=, **=, //=)
  - Logical – and, or
  - Membership – in, not in
• Precedence of operators:

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
<th>Precedence</th>
</tr>
</thead>
<tbody>
<tr>
<td>( )</td>
<td>Parentheses</td>
<td>Highest</td>
</tr>
<tr>
<td>**</td>
<td>Exponentiation</td>
<td></td>
</tr>
<tr>
<td>~</td>
<td>Bitwise nor</td>
<td></td>
</tr>
<tr>
<td>+, -</td>
<td>Positive, Negative (Unary +, -)</td>
<td></td>
</tr>
<tr>
<td>*(multiply), / (divide), (\text{floor division}), %\text{(modulus)}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+(add), -(subtract)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&amp;</td>
<td>Bitwise and</td>
<td></td>
</tr>
<tr>
<td>^</td>
<td>Bitwise XOR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bitwise OR</td>
</tr>
<tr>
<td>&lt;, &lt;= (less than or equal), &gt; (greater than), &gt;=(greater than or equal to), ==(equal), != (not equal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>is, is not</td>
<td></td>
<td></td>
</tr>
<tr>
<td>not</td>
<td>Boolean NOT</td>
<td></td>
</tr>
<tr>
<td>and</td>
<td>Boolean AND</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td>Boolean OR</td>
<td>Low</td>
</tr>
</tbody>
</table>

Data type:

There are following basic types of variable in as explained in last chapter:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bool</td>
<td>Stores either value True or False.</td>
</tr>
<tr>
<td>int</td>
<td>Stores whole number.</td>
</tr>
<tr>
<td>float</td>
<td>Stores numbers with fractional part.</td>
</tr>
<tr>
<td>Complex</td>
<td>Stores a number having real and imaginary part (a+bj)</td>
</tr>
<tr>
<td>String</td>
<td>Stores text enclosed in single or double quote</td>
</tr>
<tr>
<td>List</td>
<td>Stores list of comma separated values of any data type between square [ ] brackets.(mutable )</td>
</tr>
<tr>
<td>Tuple</td>
<td>Stores list of comma separated values of any data type between parentheses ( ) (immutable)</td>
</tr>
<tr>
<td>Dictionary</td>
<td>Unordered set of comma-separated key:value pairs , within braces { }</td>
</tr>
</tbody>
</table>
All questions are of 1 mark.

Q.No. | Question
---|---
1. | Which of the following is a valid identifier:
   i. | 9type
   ii. | _type
   iii. | Same-type
   iv. | True
2. | Which of the following is a relational operator:
   i. | >
   ii. | //
   iii. | or
   iv. | **
3. | Which of the following is a logical operator:
   i. | +
   ii. | /=
   iii. | and
   iv. | in
4. | Identify the membership operator from the following:
   i. | in
   ii. | not in
   iii. | both i & ii
   iv. | Only i
5. | Which one is an arithmetic operator:
   i. | not
   ii. | **
   iii. | both i & ii
   iv. | Only ii
6. | What will be the correct output of the statement : >>>4/3.0
   i. | 1
   ii. | 1.0
   iii. | 1.3333
   iv. | None of the above
7. | What will be the correct output of the statement : >>> 4+2**2*10
   i. | 18
   ii. | 80
   iii. | 44
   iv. | None of the above
8. | Give the output of the following code:
   >>> a,b=4,2
   >>> a+b**2*10
   i. | 48
   ii. | 40
   iii. | iv. | 88
9. | Give the output of the following code:
   >>> a,b = 4.2,5
   >>> a-b/2**2
   i. | 4.0
   ii. | 4
   iii. | 0
   iv. | None of the above
10. | Give the output of the following code:
    >>>a,b,c=1,2,3
    >>> a/b**c+a-c*a
    i. | -2
    ii. | -2.0
    iii. | 2.0
    iv. | None of the above
11. | If a=1, b=2 and c=3 then which statement will give the output as : 2.0 from the following:
   i. | >>>a%b%c+1
   ii. | >>>a%b%c+1.0
   iii. | >>>a%b%c
   iv. | a%b%c-1
12. | Which statement will give the output as : True from the following :
   i. | >>>not -5
   ii. | >>>not 5
   iii. | >>>not 0
   iv. | >>>not(5-1)
13. | Give the output of the following code:
   >>>7*(8/(5//2))
   i. | 28
   ii. | 28.0
   iii. | 20
   iv. | 60
14. | Give the output of the following code:
   >>>import math
   >>>math.ceil(1.03)+math.floor(1.03)
   i. | 3
   ii. | -3.0
   iii. | 3.0
   iv. | None of the above
15. | What will be the output of the following code:
   >>>import math
   >>>math.fabs(-5.03)
   i. | 5.0
   ii. | 5.03
   iii. | -5.03
   iv. | None of the above
16. | Single line comments in python begin with……………….. symbol.
   i. | #
   ii. | “
   iii. | %
   iv. | _
17. | Which of the following are the fundamental building block of a python program.
   i. | Identifier
   ii. | Constant
   iii. | Punctuators
   iv. | Tokens
18. | The input() function always returns a value of……………..type.
   i. | Integer
   ii. | float
   iii. | string
   iv. | Complex
19. | ………… function is used to determine the data type of a variable.
   i. | type()
   ii. | id()
   iii. | print()
   iv. | str()
20. | The smallest individual unit in a program is known as………………
   i. | Token
   ii. | keyword
   iii. | punctuator
   iv. | identifier
# Decision making statements in python

<table>
<thead>
<tr>
<th>Statement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>if statement</td>
<td>An if statement consists of a boolean expression followed by one or more statements.</td>
</tr>
<tr>
<td>if...else statement</td>
<td>An if statement can be followed by an optional else statement, which executes when the boolean expression is false.</td>
</tr>
<tr>
<td>if…elif…else</td>
<td>If the first boolean expression is false, the next is checked and so on. If one of the condition is true, the corresponding statement(s) executes, and the statement ends.</td>
</tr>
<tr>
<td>nested if…else statements</td>
<td>It allows to check for multiple test expression and execute different codes for more than two conditions.</td>
</tr>
</tbody>
</table>

# Iteration or Looping construct statements in python

<table>
<thead>
<tr>
<th>Loop</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>for loop: for&lt;ctrl_var&gt;in&lt;sequence&gt;: &lt;statement in loop body&gt; else: &lt;statement&gt;</td>
<td>It is used to iterate/repeat ifself over a range of values or sequence one by one.</td>
</tr>
<tr>
<td>while loop: while&lt;test_exp&gt;: body of while else: body of else</td>
<td>The while loop repeatedly executes the set of statement till the defined condition is true.</td>
</tr>
</tbody>
</table>
21. Which of the following is not a decision making statement  
   i. if..else statement   ii. for statement   iii. if-elif statement   iv. if statement

22. ……….loop is the best choice when the number of iterations are known.  
   i. while   ii. do-while   iii. for   iv. None of these

23. How many times will the following code be executed.
   ```python
   a=5
   while a>0:
       print(a)
       print(“Bye”)
   ```
   i. 5 times   ii. Once   iii. Infinite   iv. None of these

24. What abandons the current iteration of the loop  
   i. continue   ii. stop   iii. infinite   iv. Break

25. Find the output of the following python program
   ```python
   for i in range(1,15,4):
       print(i, end=’,’)
   ```
   i. 1,2,3   ii. 2,3,4   iii. 1,5,10,14   iv. 1,5,9,13

26. ……….loop is the best when the number of iterations are not known.  
   i. while   ii. do-while   iii. for   iv. None of these

27. In the nested loop ………..loop must be terminated before the outer loop.  
   i. Outer   ii. enclosing   iii. inner   iv. None of these

28. ……….statement is an empty statement in python.  
   i. pass   ii. break   iii. continue   iv. if

29. How many times will the following code be executed  
   ```python
   for i in range(1,15,5):
       print(i,end=’,’)
   ```
   i. 3   ii. 4   iii. 1   iv. infinite

30. Symbol used to end the if statement:  
   i. Semicolon(;)   ii. Hyphen(-)   iii. Underscore(_)   iv. colon(:)

String: Text enclosed inside the single or double quotes referred as String.  
String Operations: String can be manipulated using operators like concatenation (+), repetition (*) and membership operator like in and not in.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concatenation</td>
<td>Str1 + Str2</td>
</tr>
<tr>
<td>Repetition</td>
<td>Str * x</td>
</tr>
<tr>
<td>Membership</td>
<td>in, not in</td>
</tr>
<tr>
<td>Comparison</td>
<td>str1 &gt; str2</td>
</tr>
<tr>
<td>Slicing</td>
<td>String[range]</td>
</tr>
</tbody>
</table>
**String Methods and Built-in functions:**

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>len()</td>
<td>Returns the length of the string.</td>
</tr>
<tr>
<td>capitalize()</td>
<td>Converts the first letter of the string in uppercase</td>
</tr>
<tr>
<td>split()</td>
<td>Breaks up a string at the specified separator and returns a list of substrings.</td>
</tr>
<tr>
<td>replace()</td>
<td>It replaces all the occurrences of the old string with the new string.</td>
</tr>
<tr>
<td>find()</td>
<td>It is used to search the first occurrence of the substring in the given string.</td>
</tr>
<tr>
<td>index()</td>
<td>It also searches the first occurrence and returns the lowest index of the substring.</td>
</tr>
<tr>
<td>isalpha()</td>
<td>It checks for alphabets in an inputted string and returns True in string contains only letters.</td>
</tr>
<tr>
<td>isalnum()</td>
<td>It returns True if all the characters are alphanumeric.</td>
</tr>
<tr>
<td>isdigit()</td>
<td>It returns True if the string contains only digits.</td>
</tr>
<tr>
<td>title()</td>
<td>It returns the string with first letter of every word in the string in uppercase and rest in lowercase.</td>
</tr>
<tr>
<td>count()</td>
<td>It returns number of times substring str occurs in the given string.</td>
</tr>
<tr>
<td>lower()</td>
<td>It converts the string into lowercase</td>
</tr>
<tr>
<td>islower()</td>
<td>It returns True if all the letters in the string are in lowercase.</td>
</tr>
<tr>
<td>upper()</td>
<td>It converts the string into uppercase</td>
</tr>
<tr>
<td>isupper()</td>
<td>It returns True if all the letters in the string are in uppercase.</td>
</tr>
<tr>
<td>lstrip()</td>
<td>It returns the string after removing the space from the left of the string</td>
</tr>
<tr>
<td>rstrip()</td>
<td>It returns the string after removing the space from the right of the string</td>
</tr>
<tr>
<td>strip()</td>
<td>It returns the string after removing the space from the both side of the string</td>
</tr>
<tr>
<td>isspace()</td>
<td>It returns True if the string contains only whitespace characters, otherwise returns False.</td>
</tr>
<tr>
<td>istitle()</td>
<td>It returns True if the string is properly title-cased.</td>
</tr>
<tr>
<td>swapcase()</td>
<td>It converts uppercase letter to lowercase and vice versa of the given string.</td>
</tr>
<tr>
<td>ord()</td>
<td>It returns the ASCII/Unicode of the character.</td>
</tr>
<tr>
<td>chr()</td>
<td>It returns the character represented by the imputed Unicode /ASCII number</td>
</tr>
</tbody>
</table>
31. Which of the following is not a python legal string operation.
   i. ‘abc’+‘aba’ ii. ‘abc’*3 iii. ‘abc’+3 iv. ‘abc’.lower()
32. Which of the following is not a valid string operation.
   i. Slicing ii. concatenation iii. Repetition iv. floor
33. Which of the following is a mutable type.
   i. string ii. tuple iii. int iv. list
34. What will be the output of the following code
   str1=”I love Python”
   strlen=len(str1)+5
   print(strlen)
   i. 18 ii. 19 iii. 13 iv. 15
35. Which method removes all the leading whitespaces from the left of the string.
   i. split() ii. remove() iii. lstrip() iv rstrip()
36. It returns True if the string contains only whitespace characters, otherwise returns False. i) isspace() ii. strip() iii. islower() iv. isupper()
37. It converts uppercase letter to lowercase and vice versa of the given string.
   i. lstrip() ii. swapcase() iii. istitle() iv. count()
38. What will be the output of the following code.
   Str='Hello World! Hello Hello'
   Str.count('Hello',12,25)
   i. 2 ii. 3 iii. 4 iv. 5
39. What will be the output of the following code.
   Str="123456"
   print(Str.isdigit())
   ii. True ii. False iii. None iv. Error
40. What will be the output of the following code.
   Str=”python 38”
   print(Str.isalnum())
   iii. True ii. False iii. None iv. Error
41. What will be the output of the following code.
   Str=”pyThOn”
   print(Str.swapcase())
   i. PYtHoN ii. pyThon iii. python iv. PYTHON
42. What will be the output of the following code.
   Str=”Computers”
   print(Str.rstrip("rs"))
   i. Computer ii. Computers iii. Compute iv. compute
43. What will be the output of the following code.
   Str=”This is Meera\ pen”
   print(Str.isdigit())
   i. 21 ii. 20 iii. 18 iv. 19
44. How many times is the word ‘Python’ printed in the following statement.
   s = ”I love Python”
   for ch in s[3:8]:
       print(‘Python’)
   i. 11 times ii. 8 times iii. 3 times iv. 5 times
45. Which of the following is the correct syntax of string slicing:
   i. str_name[start:end]      iii. str_name[start:step]
   ii. str_name[step:end]      iv. str_name[step:start]

46. What will be the output of the following code?
   A = "Virtual Reality"
   print(A.replace(‘Virtual’,’Augmented’))
   i. Virtual Augmented      iii. Reality Augmented
   ii. Augmented Virtual     iv. Augmented Reality

47. What will be the output of the following code?
   print(“ComputerScience”.split(“er”,2))
   i. [“Computer”,”Science”] iii. [“Comput”,”Science”]
   ii. [“Comput”,”erScience”] iv. [“Comput”,”er”,”Science”]

48. Following set of commands are executed in shell, what will be the output?
   >>>str="hello"
   >>>str[:2]
   i. he ii. lo iii. olleh iv. hello

49. …………function will always return tuple of 3 elements.
   i. index() ii. split() iii. partition() iv. strip()

50. What is the correct python code to display the last four characters of “Digital India”
   i. str[-4:] ii. str[4:] iii. str[*str] iv. str[/4:] 

LIST: A list is a collection of comma-separated values (items) of same or different type within square brackets. List types can be of three types:
   1. Empty list  2. Long List  3. Nested List

2. Built-in Function (Manipulating Lists)

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>append()</td>
<td>It adds a single item to the end of the list.</td>
</tr>
<tr>
<td>extend()</td>
<td>It adds one list at the end of another list</td>
</tr>
<tr>
<td>insert()</td>
<td>It adds an element at a specified index.</td>
</tr>
<tr>
<td>reverse()</td>
<td>It reverses the order of the elements in a list.</td>
</tr>
<tr>
<td>index()</td>
<td>It returns the index of first matched item from the list.</td>
</tr>
<tr>
<td>len()</td>
<td>Returns the length of the list i.e. number of elements in a list</td>
</tr>
<tr>
<td>sort()</td>
<td>This function sorts the items of the list.</td>
</tr>
<tr>
<td>clear()</td>
<td>It removes all the elements from the list.</td>
</tr>
<tr>
<td>count()</td>
<td>It counts how many times an element has occurred in a list and returns it.</td>
</tr>
<tr>
<td>pop()</td>
<td>It removes the element from the end of the list or from the specified index and also returns it.</td>
</tr>
</tbody>
</table>
**del Statement**  
It removes the specified element from the list.

**remove()**  
It is used when we know the element to be deleted, not the index of the element.

**max()**  
Returns the element with the maximum value from the list.

**min()**  
Returns the element with the minimum value from the list.

---

### 51. **Given the list** \( L = [11, 22, 33, 44, 55] \), write the output of `print(L[: -1])`.

- i. \([1, 2, 3, 4, 5]\)
- ii. \([22, 33, 44, 55]\)
- iii. \([55, 44, 33, 22, 11]\)
- iv. Error in code

### 52. Which of the following can add an element at any index in the list?

- i. `insert()`  
- ii. `append()`  
- iii. `extend()`  
- iv. All of these

### 53. Which of the following function will return a list containing all the words of the given string?

- i. `split()`  
- ii. `index()`  
- iii. `count()`  
- iv. `list()`

### 54. Which of the following statements are True.

- a. \([1, 2, 3, 4] > [4, 5, 6]\)
- b. \([1, 2, 3, 4] < [1, 5, 2, 3]\)
- c. \([1, 2, 3, 4] > [1, 2, 0, 3]\)
- d. \([1, 2, 3, 4] < [1, 2, 3, 2]\)

- i. a, b, d  
- ii. a, c, d  
- iii. a, b, c  
- iv. Only d

### 55. If \( L_1 = [20, 30] \)  
\( L_2 = [20, 30] \)  
\( L_3 = ['20', '30'] \)  
\( L_4 = [20.0, 30.0] \), then which of the following statements will not return ‘False’:

- a. \( L_1 == L_2 \)
- b. \( L_4 > L_1 \)
- c. \( L_1 > L_2 \)
- d. \( L_2 == L_2 \)

- i. b, c  
- ii. a, b, c  
- iii. a, c, d  
- iv. a, d

### 56. \( L_1 = [10, 20, 30, 40, 50] \)  
\( L_2 = L_1[1:4] \)  
What will be the elements of list \( L_2 \):

- i. \([10, 30, 50]\)
- ii. \([20, 30, 40, 50]\)
- iii. \([10, 20, 30]\)
- iv. \([20, 30, 40]\)

### 57. \( L = ['red', 'blue'] \)  
\( L = L + 'yellow' \)  
What will be the elements of list \( L \):

- i. \(['red', 'blue', 'yellow']\)
- ii. \(['red', 'yellow']\)
- iii. \(['red', 'blue', 'yellow']\)
- iv. Error

### 58. What will be the output of the following code:

- \( L = [1, 2, 3, 4]\)
- \( M = [5, 6, 7, 8]\)
- \( N = M + L\)
- \( print(N)\)

- i. \([1, 2, 3, 5, 6, 7, 8]\)
- ii. \([1, 2, 3, 4, 5, 6, 7, 8]\)
- iii. \([1, 2, 3, 4][5, 6, 7, 8]\)
- iv. Error

### 59. What will be the output of the following code:

- \( L = [1, 2, 3, 4]\)
- \( M = L[1]*2\)
- \( N = M[2]\)
- \( print(N)\)

- i. \([1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 3, 4]\)
- ii. \([1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 3, 4]\)
- iii. \([1, 2, 3, 4][4, 5, 6, 7]\)
- iv. \([1, 2, 3, 4]\)

### 60. Match the columns: if

- \( L = list('computer')\)

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
61. If a list is created as
>>>l=[1,2,3,'a',['apple','green'],5,6,7,['red','orange']] then what will be the output of the following statements:

>>>l[4][1]
i. ‘apple’ iii. ‘green’
ii. ‘red’ iv. ‘orange’

62. >>>l[8][0][2]
i. ‘d’ iii. ‘e’
ii. ‘r’ iv. ‘o’

63. >>>l[-1]
i. ['apple','green'] iii. ['red','orange']
ii. ['red'] iv. ['orange']

64. >>>len(l)
i. 10 iii. 9
ii. 8 iv. 11

65. What will be the output of the following code:
>>>l1=[1,2,3]
>>>l1.append([5,6])

>>>l1
i. [1,2,3,5,6] ii. [1,2,3,5,6] iii. [5,6] iv. [1,2,3,5,6]

66. What will be the output of the following code:
>>>l1=[1,2,3]
>>>l2=[5,6]

>>>l1.extend(l2)

>>>l1
i. [5,6,1,2,3] ii. [1,2,3,5,6] iii. [1,3,5] iv. [1,2,3,6]

67. What will be the output of the following code:
>>>l1=[1,2,3]

>>>l1.insert(2,25)

>>>l1
i. [1,2,3,25] ii. [1,25,2,3 ] iii. [1,2,25,3] iv. [25,1,2,3,6]

68. >>>l1=[10,20,30,40,50,60,10,20,10]

>>>l1.count('10')
i. 3 ii. 0 iii. 2 iv. 9

69. Which operators can be used with list?
i. in ii. not in iii. both (i)&(ii) iv. Arithmetic operator only

70. Which of the following function will return the first occurrence of the specified element in a list.
i. sort() ii. value() iii. index() iv. sorted()

Tuples and Dictionary: Tuple is a data structure in python, A tuple consists of multiple values in a single variable separated by commas. Tuples are enclosed within parentheses ( ). Tuple is an immutable data type.
Common Tuple Operations:
<table>
<thead>
<tr>
<th>Operation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concatenation</td>
<td>Tuple1 + Tuple2</td>
</tr>
<tr>
<td>Repetition</td>
<td>Tuple * x</td>
</tr>
<tr>
<td>Index</td>
<td>Tuple.index(ele)</td>
</tr>
<tr>
<td>Count</td>
<td>Tuple.count(ele)</td>
</tr>
<tr>
<td>Slicing</td>
<td>Tuple[range]</td>
</tr>
<tr>
<td>Membership</td>
<td>in and not in</td>
</tr>
</tbody>
</table>

**Tuple Functions:**

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>del statement</td>
<td>It is used to delete the tuple.</td>
</tr>
<tr>
<td>index( )</td>
<td>It returns the index of first matched item from the tuple.</td>
</tr>
<tr>
<td>len( )</td>
<td>Returns the length of the tuple i.e. number of elements in a tuple.</td>
</tr>
<tr>
<td>count( )</td>
<td>It counts how many times an element has occurred in a tuple and returns it.</td>
</tr>
<tr>
<td>any ( )</td>
<td>It returns True if a tuple is having at least one item otherwise False.</td>
</tr>
<tr>
<td>sorted( )</td>
<td>It is used to sort the elements of a tuple. It returns a list after sorting.</td>
</tr>
<tr>
<td>sum( )</td>
<td>It returns sum of the elements of the tuple.</td>
</tr>
<tr>
<td>max( )</td>
<td>Returns the element with the maximum value from the tuple.</td>
</tr>
<tr>
<td>min( )</td>
<td>Returns the element with the minimum value from the tuple.</td>
</tr>
</tbody>
</table>

**Dictionary:** Python Dictionaries are a collection of some key-value pairs. Dictionaries are mutable unordered collections with elements in the form of a key:value pairs that associate keys to values. Dictionaries are enclosed within braces `{ }`

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>items( )</td>
<td>It returns the content of dictionary as a list of tuples having key-value pairs.</td>
</tr>
<tr>
<td>keys( )</td>
<td>It returns a list of the key values in a dictionary</td>
</tr>
<tr>
<td>Function</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>values()</strong></td>
<td>It returns a list of values from key-value pairs in a dictionary.</td>
</tr>
<tr>
<td><strong>get()</strong></td>
<td>It returns the value for the given key, if key is not available then it returns None.</td>
</tr>
<tr>
<td><strong>copy()</strong></td>
<td>It creates the copy of the dictionary.</td>
</tr>
<tr>
<td><strong>len()</strong></td>
<td>Returns the length of the Dictionary i.e. number of key:value pairs in a Dictionary.</td>
</tr>
<tr>
<td><strong>fromkeys()</strong></td>
<td>It is used to create dictionary from a collection of keys(tuple/list).</td>
</tr>
<tr>
<td><strong>clear()</strong></td>
<td>It removes all the elements from the Dictionary.</td>
</tr>
<tr>
<td><strong>sorted()</strong></td>
<td>It sorts the elements of a dictionary by its key or values.</td>
</tr>
<tr>
<td><strong>popitem()</strong></td>
<td>It removes the last item from dictionary and also returns the deleted item.</td>
</tr>
<tr>
<td><strong>max()</strong></td>
<td>Returns the key having maximum value in the Dictionary.</td>
</tr>
<tr>
<td><strong>min()</strong></td>
<td>Returns the key having minimum value in the Dictionary.</td>
</tr>
</tbody>
</table>

71. Which of the statement(s) is/are correct.
   i. Python dictionary is an ordered collection of items.
   ii. Python dictionary is a mapping of unique keys to values
   iii. Dictionary is mutable.
   iv. All of these.

72. ........function is used to convert a sequence data type into tuple.
   i. List()    ii. tuple()    iii. TUPLE    iv. tup()

73. It tup=(20,30,40,50), which of the following is incorrect
   i. print(tup[3])  ii. tup[2]=55  iii. print(max(tup))   iv. print(len(tup))

74. Consider two tuples given below:

>>> tup1=(1,2,4,3)
>>> tup2=(1,2,3,4)

What will the following statement print(tup1<tup2)
   i. True  ii. False  iii. Error  iv. None of these

75. Which function returns the number of elements in the tuple
   i. len()  ii. max()  iii. min()  iv. count()
76. Which function is used to return a value for the given key.
   i. len( ) ii. get( ) iii. keys( ) iv. None of these

77. Keys of the dictionary must be
   i. similar ii. unique iii. can be similar or unique iv. All of these

78. Which of the following is correct to insert a single element in a tuple.
   i. T=4 ii. T=(4) iii. T(4,) iv. T=[4,]

79. Which of the following will delete key-value pair for key='red' form a dictionary D1
   i. Delete D1("red") ii. del D1("red") iii. del D1["red"] iv. del D1

80. Which function is used to remove all items form a particular dictionary.
   i. clear( ) ii. pop( ) iii. delete iv. rem(

81. In dictionary the elements are accessed through
   i. key ii. value iii. index iv. None of these

82. Which function will return key-value pairs of the dictionary
   i. key( ) ii. values( ) iii. items( ) iv. get( )

83. Elements in a tuple can be of ………….type.
   i. Dissimilar ii. Similar iii. both i & ii iv. None of these

84. To create a dictionary, key-value pairs are separated by………………
   i. (;) ii. ( , ) iii. (:) iv. ( / )

85. Which of the following statements are not correct:
   a. An element in a dictionary is a combination of key-value pair
   b. A tuple is a mutable data type
   c. We can repeat a key in dictionary
   d. clear( ) function is used to deleted the dictionary.
   i. a,b,c ii. b,c,d iii. b,c,a iv. a,b,c,d

86. Which of the following statements are correct:
   a. Lists can be used as keys in a dictionary
   b. A tuple cannot store list as an element
   c. We can use extend() function with tuple.
   d. We cannot delete a dictionary once created.
   i. a,b,c ii. b,c,d iii. b,c,a iv. None of these

87. Like lists, dictionaries are……………..which mean they can be changed.
   i. Mutable ii. immutable iii. variable iv. None of these

88. To create an empty dictionary, we use
   i. d=[] ii. d=() iii. d={} iv. d= < >

89. To create dictionary with no items, we use
   ii. Dict ii. dict( ) iii. d = [] iv. None of these

90. What will be the output
   >>>d1={'rohit':56, "Raina":99}
   >>>print("Raina" in d1)
   i. True ii. False iii. No output iv. Error

91. Rahul has created the a tuple containing some numbers as
   >>>t=(10,20,30,40)
   now he wants to do the following things help him

   1. He want to add a new element 60 in the tuple, which statement he should use out of the given four.
i. >>>t+(60)
ii. >>>t + 60
iii. >>>t + (60,)
iv. >>>t + ('60')

Rahul wants to delete all the elements from the tuple, which statement he should use
i. >>>del t
ii. >>>t.clear()
iii. >>>t.remove()
iv. >>>None of these

Rahul wants to display the last element of the tuple, which statement he should use
i. >>> t.display()
ii. >>>t.pop()
iii. >>>t[-1]
iv. >>>t.last()

Rahul wants to add a new tuple t1 to the tuple t, which statement he should use
i. >>>t+t1
ii. >>>t.add(t1)
iii. >>>t*t1
iv. None of these

Rahul has issued a statement after that the tuple t is replace with empty tuple, identify the statement he had issued out of the following:

i. >>> del t
ii. >>>t= tuple()
iii. >>>t=Tuple()
iv. >>>delete t

Rahul wants to count that how many times the number 10 has come:

i. >>>t.count(10)
ii. >>>t[10]
iii. >>>count.t(10)
iv. None of these

Rahul wants to know that how many elements are there in the tuple t, which statement he should use out of the given four

i. >>>t.count()
ii. >>>len(t)
iii. >>>count(t)
iv. >>>t.sum()

>>>t=(1,2,3,4)

Write the statement should be used to print the first three elements 3 times

i. >>>print(t*3)
ii. >>>t*3
iii. >>>t[:3]*3
iv. >>>t+t

Match the output with the statement given in column A with Column B

1. >>>tuple([10,20,30]) a. >>> (10,20,30)
2. >>>("Tea",)* 3 b. >>> 2
3. >>>tuple("Item") c. >>> ('Tea', 'Tea', 'Tea')
4. >>>print(len(tuple([1,2]))) d. >>> ('T', 't', 'e', 'm')
Write the output of the following code:

```python
>>> d = {'name': 'rohan', 'dob': '2002-03-11', 'Marks': '98'}
>>> d1 = {'name': 'rajk'}
>>> d1 = d.copy()
>>> print("d1 : ", d1)
```

i. `d1 : {'name': 'rohan', 'dob': '2002-03-11', 'Marks': '98'}`
ii. `d1 = {'name': 'rohan', 'dob': '2002-03-11', 'Marks': '98'}`
iii. `{name': 'rohan', 'dob': '2002-03-11', 'Marks': '98'}`
iv. `(d1 : {'name': 'rohan', 'dob': '2002-03-11', 'Marks': '98'})`
WORKING WITH FUNCTIONS

**FUNCTION:** A function is a subprogram that acts on data and often returns a value. Python functions can belong to one of the following three categories:

1. Built-in Function  
2. Functions defined in modules  
3. User defined functions

Arguments and Parameters: The values being passed through a function call statement are called argument (or actual parameter or actual argument). The values received in the function definition/header are called parameter (or formal parameter of formal argument)

Note: A function header cannot have expressions. It can have just names or identifiers. Python supports three types of arguments/parameters:

1. **Positional Argument (Required Arguments):** The way of parameter and argument specification is called Positional or Required arguments or Mandatory arguments

2. **Default Arguments:** A parameter having default value in the function header is known as a default parameter.

3. **Keyword (or named) Arguments:** Keyword arguments are the named arguments with assigned values being passed in the function call statement.

**Rules for combining all three types of statements:**

i. An argument list must first contain positional (required) arguments followed by any keyword argument.

ii. Keyword arguments should be taken from the required arguments preferably.

iii. We cannot specify a value for an argument more than once.

**There can be broadly two types of functions in Python:**

1. Functions returning some value (Non – void function)
2. Functions not returning any value (void function)

Scope of variable: Part(s) of program within which a name is legal and accessible, is called scope of the variable (name).

**There are two kinds of scopes in Python:**

1. Global Scope: A name declared outside all the function body is called Global variable and it has Global Scope.
2. Local Scope: A name declared within a function is called Local variable and it has Local scope.

**Lifetime:** The time for which a variable or name remains in memory is called Lifetime of variable.
## Built-in Functions

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>eval()</code></td>
<td>It is used to evaluate the value of a string and returns numeric value</td>
</tr>
<tr>
<td><code>min()</code> and <code>max()</code></td>
<td>Both can take two or more arguments and returns the smallest and largest value respectively.</td>
</tr>
<tr>
<td><code>abs()</code></td>
<td>It returns the absolute value of a single number.</td>
</tr>
<tr>
<td><code>type()</code></td>
<td>It is used to determine the type of variable.</td>
</tr>
<tr>
<td><code>round()</code></td>
<td>It returns the result up to a specified number of digit.</td>
</tr>
<tr>
<td><code>len()</code></td>
<td>Returns the length of an object.</td>
</tr>
<tr>
<td><code>range()</code></td>
<td>It is used to define a series of numbers.</td>
</tr>
</tbody>
</table>

### Functions from math module

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ceil(x)</code></td>
<td>It returns the smallest integer that is greater than or equal to x.</td>
</tr>
<tr>
<td><code>floor(x)</code></td>
<td>It returns the largest integer that is less than or equal to x.</td>
</tr>
<tr>
<td><code>pow(x,y)</code></td>
<td>It returns the value of $x^y$, where $x$ and $y$ are numeric expressions, and returns the output in floating point number.</td>
</tr>
<tr>
<td><code>sqrt(x)</code></td>
<td>Returns the square root of $x$.</td>
</tr>
</tbody>
</table>

### Functions from random module

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>random()</code></td>
<td>It generates a random number from 0 to 1.</td>
</tr>
<tr>
<td><code>randrange()</code></td>
<td>It generates an integer between its lower and upper argument. By default the lower argument is 0 and upper argument is 1</td>
</tr>
<tr>
<td><code>choice()</code></td>
<td>It is used for making a random selection from a sequence like list, tuple or string.</td>
</tr>
<tr>
<td><code>shuffle()</code></td>
<td>It is used to shuffle or swap the contents of a list.</td>
</tr>
</tbody>
</table>

101 A function in python begins with which keyword?
   i.  void     ii.  return      iii.  int     iv.  Def

102 Name the statement that sends back a value from a function
   i.  print      ii.  input      iii.  return    iv.  None

103 What is the output of the program given below:
   x=50
   def func(x):
     x=2
     func(x)
   print(‘x is now’,x)
i. x is now 50  iii. x is now 2
ii. x is now 100  iv. Error

104 What is the output of the program given below:
```python
import random
x = random.random()
y= random.randint(0,4)
print(int(x),":", y+int(x))
```

<p>| | | | |</p>
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</thead>
<tbody>
<tr>
<td>i.</td>
<td>0: 0</td>
<td>iii.</td>
<td>2: 4</td>
</tr>
<tr>
<td>ii.</td>
<td>1: 6</td>
<td>iv.</td>
<td>0: 5</td>
</tr>
</tbody>
</table>

105 def cal(a,b,c):
    return a*3,b*3,c*3
val=cal(10,12,14)
print(type(val))
print(val)

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</thead>
<tbody>
<tr>
<td>i.</td>
<td>[30, 24, 28]</td>
<td>iii.</td>
<td>[30,36,42]</td>
</tr>
<tr>
<td>ii.</td>
<td>[10, 20, 30]</td>
<td>iv.</td>
<td>[10,12,14]</td>
</tr>
</tbody>
</table>

106 What is the output of the expression:round(4.576)

<p>| | | | |</p>
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<thead>
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</thead>
<tbody>
<tr>
<td>i.</td>
<td>4.5</td>
<td>ii.</td>
<td>5</td>
</tr>
<tr>
<td>iii.</td>
<td>4</td>
<td>iv.</td>
<td>4.6</td>
</tr>
</tbody>
</table>

107 What is the output of the function shown below?
```python
import math
abs(math.sqrt(25))
```

<p>| | | | |</p>
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>Error</td>
<td>ii.</td>
<td>-5</td>
</tr>
<tr>
<td>iii.</td>
<td>5</td>
<td>iv.</td>
<td>5.0</td>
</tr>
</tbody>
</table>

108 What is the output of the functions shown below?
```python
>>>max(False,-3,-4), 2,7)
i. 2 ii. False iii. -3 iv. -4
```

109 What are the outcomes of the function shown below?
```python
>>>x=3
>>>eval('x**2')
```

<p>| | | | |</p>
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>Error</td>
<td>ii.</td>
<td>1</td>
</tr>
<tr>
<td>iii.</td>
<td>9</td>
<td>iv.</td>
<td>6</td>
</tr>
</tbody>
</table>

110 Which of the following functions does not throw an error?
```python
i. ord() ii. ord(' ') iii. ord("") iv. ord('"")
```

111 What is the output of below program?
```python
def say(message, times = 1):
    print(message * times , end = ' ')
say('Hello and')
say('World', 5)
```

<p>| | | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>i.</td>
<td>Hello and WorldWorldWorldWorldWorld</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii.</td>
<td>Hello and World</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii.</td>
<td>Hello and World,World,World,World,World</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv.</td>
<td>Hello and HelloHelloHelloHelloHello</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

112 What is a variable defined inside a function referred to as?
```python
i. A global variable ii. A volatile variable
iii. A local variable iv. An automatic variable
```

113 How many keyword arguments can be passed to a function in a single function call?
```python
i. zero ii. one iii. zero or more iv. one or more
```
How are required arguments specified in the function heading?

i. identifier followed by an equal to sign and the default value
ii. identifier followed by the default value within backticks ("")
iii. identifier followed by the default value within squarebrackets ([ ])
iv. identifier

What is returned by

>>> math.ceil(3.4)?

i. 3 ii. 4 iii. 4.0 iv. 3.0

What is the value returned by

>>> math.floor(3.4)

i. 3 ii. 4 iii. 4.0 iv. 3.0

What is returned by

>>> math.ceil(-3.4)?

ii. 3 ii. 4 iii. 4.0 iv. -3

What is the value returned by

>>> math.floor(-3.4)

ii. 3 ii. -4 iii. 4.0 iv. 3.0

What is displayed on executing print(math.fabs(-3.4))?

i. -3.4 ii. 3.4 iii. 3 iv. -3

What is the output of print(math.pow(3, 2))?

i. 9 ii. 9.0 iii. None iv. None of these

What is the value of x if x = math.sqrt(4)?

i. 2 ii. 2.0 iii. (2, -2) iv. (2.0, -2.0)

To include the use of functions which are present in the random library, we must use the option:

i. import random ii. random.h
ii. import.random ii. random.random

What is the output of the code shown below?

import random
random.choice(2,3,4)

i. An integer other than 2, 3 and 4 ii. Either 2, 3 or 4
iii. Error iv. 3 only

What is the output of the function shown below (random module has already been imported)?

>>>random.choice('sun')

i. sun ii. u iii. either s, u or n iv. Error

What is the output of the function shown below if the random module has already been imported?

>>>import random
>>>random.randint(3.5,7)

i. Error ii. Any integer between 3.5 and 7, including 7
iii. Any integer between 3.5 and 7, excluding 7
iv. The integer closest to the mean of 3.5 and 7

Which type of elements are accepted by random.shuffle()?

i. strings ii. lists iii. tuples iv. integers

.........keyword is used to define a function.

i. Void ii. func iii. def iv. None

Which of the following statements are True out of the given below:
1. More than one value(s) can be returned by a function
2. The variable declared inside a function is a Global variable.
3. Once the function is defined, it may be called only once
4. A function is used by invoking it
   i. 1 & 2    ii. 1 & 4    iii. 2 & 3    iv. 2 & 4

129 Match the columns:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>max()</td>
<td>a. will compute x**y</td>
</tr>
<tr>
<td>sqrt(x)</td>
<td>b. will select a option randomly</td>
</tr>
<tr>
<td>choice()</td>
<td>c. will return the largest value</td>
</tr>
<tr>
<td>pow(x,y)</td>
<td>d. will compute $(x)^{1/2}$</td>
</tr>
</tbody>
</table>

i. 1-a,2-b,3-c,4-d  iii. 1-c,2-d,3-b,4-a
ii. 1-d,2-a,3-c,4-b  iv. 1-b,2-c,3-d,4-a

130 What will be the output of the following code:
A=1
def f():
    A=10
    print(A)
i. 1    ii. 10   iii. Error   iv. None

131 >>>def Interest(p,c,t=2,r=0.09):
    return p*t*r
Considering the above defined function which of following function call are legal.
1. Interest(p=1000,c=5)
2. Interest(r=0.05,5000,3)
3. Interest(500,t=2,r=0.05)
4. Interest(c=4,r=0.12,p=5000)
i. 1, 2 and 4  ii. 2 & 3  iii. 1 & 4  iv. 3 & 4

133 Consider the program given in question no.132 and answer the question from 133 to 138 given below:

What will come in place of statement 2:
i. upper()  ii. isupper  iii. isupper()  iv. is_upper()

What will come in place of statement 3:
i. [digits]  ii. ["digits"]  iii. d["digits"]  iv. d["Digits"]

What will come in place of statement 4:
i. ["Special_chr"]  iii. "Special_chr"
ii. D["Special_chr"]  iv. d("Special_chr")

What will come in place of statement 5:
i. s  ii. S  iii. d["s"]  iv. d[s]

What will come in place of statement 6:
i. d["Upper_case"]  iii. ["Upper_case"]
ii. d["s"]  iv. d[s]

What will come in place of statement 7:
i. d["Digits"]  iii. d["digits"]
ii. d["Digit"]  iv. d[s]

The built-in function  sin() belongs to which module:
i. random  ii. pandas  iii. math  iv. numpy

----------function returns the smallest integer greater than the given floating point number.
i. floor()  ii. ceil()  iii. sqrt()  iv. CEIL()
function will return the largest integer less than the given floating point number.
   i.  floor()  ii.  ceil()  iii.  sqrt()  iv.  CEIL()

function returns the length of the object being passed.
   i.  Length()  ii.  Len()  iii.  len()  iv.  count()

function returns the absolute value.
   i.  Abs()  ii.  abs()  iii.  absolute()  iv.  None of these

The range(x) function will generate the series of numbers from:
   i.  Min to max  ii.  o to x-1  iii.  o to x  iv.  x

function can identify the whitespace in a given string.
   i.  Space()  ii.  isspace()  iii.  Isspace()  iv.  is_space()

Consider the statement given below and answer the question:
>>> S = 'My name is Ravindra'
Which statement will print “True” out of the given:
   i.  print(S.isspace( ))
   ii.  print (s.isspace( ))
   iii.  print(S[2].isspace)
   iv.  print(S[2].isspace( ))

A variable declared outside all the functions in a python program, then mention the statements which are True in the context of the variable.
   1.  This variable will have global scope.
   2.  This variable will not be accessible from anywhere in the prog.
   3.  This variable will have a large lifetime than local variable.
   4.  This variable will be referred as Local variable.
   i.  Only 1&2  ii.  Only 1  iii.  Only 1&3  iv.  Only 3

Answers:

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<td>1</td>
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<td>iii</td>
<td>114</td>
<td>i</td>
<td>115</td>
<td>ii</td>
<td>116</td>
<td>i</td>
<td>117</td>
<td>iv</td>
</tr>
</tbody>
</table>

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Data File Handling

Key Points of Data File Handling

File:- A file is a collection of related data stored in computer storage for future data retrieval. Data files can be stored in two ways:

1. Text Files: Text files are structured as a sequence of lines, where each line includes a sequence of characters.
2. Binary Files: A binary file is any type of file that is not a text file.

WORKING WITH TEXT FILES:

Basic operations with files:

a. Read the data from a file
b. Write the data to a file
c. Append the data to a file
d. Delete a file

There are 3 types of functions to read data from a file: –read(), readline(), readlines()

Binary files are used to store binary data such as images, video files, audio files etc. They store data in the binary format (0's and 1's).

In Binary files there is no delimiter for a line. To open files in binary mode, when specifying a mode, add 'b' to it. Pickle module can be imported to write or read data in a binary file.

CSV (Comma Separated Values) is a file format for data storage which looks like a text file. The information is organized with one record on each line and each field is separated by comma.

CSV File Characteristics

• One line for each record
• Comma separated fields
• Space-characters adjacent to commas are ignored
• Fields with in-built commas are separated by double quote characters.

Compare text files, binary files and csv files and write pros and cons of each of them.

<table>
<thead>
<tr>
<th></th>
<th>Text Files</th>
<th>Binary Files</th>
<th>CSV Files</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>It is capable to handle textual data.</td>
<td>It is capable to handle large file.</td>
<td>It is very common format and platform independent.</td>
</tr>
<tr>
<td>2</td>
<td>It consists of series of lines of a set of letters, numbers or symbols (String)</td>
<td>It consists of data with a specific pattern without any delimiter.</td>
<td>It consists of plain text with a list of data with a delimiter.</td>
</tr>
<tr>
<td>3</td>
<td>Any text editors like notepad can be used to read them.</td>
<td>No specific programs can be used to read them, python provides functions to read data.</td>
<td>It can be read using text editors like notepads and spreadsheet software.</td>
</tr>
<tr>
<td>4</td>
<td>Every line ends with EOL.</td>
<td>There is no specific EOL character.</td>
<td>It terminates a line automatically when the delimiter is not used after data.</td>
</tr>
</tbody>
</table>
MCQs on Data File Handling

1. Every file has its own identity associated with it. Which is known as –
   a. icon
   b. extension
   c. format
   d. file type

2. Which of the following is not a known file type?
   a. .pdf
   b. jpg
   c. mp3
   d. txt

3. In f=open(“data.txt”, “r”), r refers to __________.
   a. File handle
   b. File object
   c. File Mode
   d. Buffer

4. EOL stands for
   a. End Of Line
   b. End Of List
   c. End of Lines
   d. End Of Location

5. Which of the following file types allows to store large data files in the computer memory?
   a. Text Files
   b. Binary Files
   c. CSV Files
   d. None of these

6. Which of the following file types can be opened with notepad as well as ms excel?
   a. Text Files
   b. Binary Files
   c. CSV Files
   d. None of these

7. Which of the following is not a proper file access mode?
   a. close
   b. read
   c. write
   d. append
8. To read 4th line from text file, which of the following statement is true?
   a. dt = f.readlines();print(dt[3])
   b. dt=f.read(4) ;print(dt[3])
   c. dt=f.readline(4);print(dt[3])
   d. All of these

9. Which of the following function flushes the files implicitly?
   a. flush()
   b. close()
   c. open()
   d. fflush()

10. Which of the following functions flushes the data before closing the file?
    a. flush()
    b. close()
    c. open()
    d. fflush()

11. In F=open("MyFile.txt") , name of file object is
    a. open
    b. MyFile.txt
    c. F
    d. F=open()

12. Default EOL character in Python.
    a. ‘\n’
    b. ‘\r’
    c. ‘’
    d. ‘\t’

13. Which of the following is not a file extension for text files?
    a. .txt
    b. .ini
    c. .rtf
    d. .DAT

14. What is the first thing to do before performing any functions on a text file?
    a. Import modules
    b. Open file
    c. Read file
    d. Print the name of the file
15. What is a file object?
   a. It serves as a link to the file.
   b. It is a file present in a computer.
   c. A keyword
   d. A module in python

16. Which is not a correct file mode for text files?
   a. a
   b. ar
   c. a+
   d. r+

17. What does the prefix r in front of a string do?
   a. It makes the string a raw string
   b. It opens the file in read mode
   c. It converts the file into text file
   d. It creates the file if it doesn’t exist

18. A file object is also known as
   a. File handle
   b. File copy
   c. File directory
   d. File link

19. How to open a text file in read mode only?
   a. r
   b. r+
   c. rb+
   d. rw+

20. How to open a text file in write and read mode?
   a. r+
   b. a+
   c. wr
   d. wb

21. Syntax for closing a file:
   a. closefile(<file object>)
   b. <fileobject>.close()
   c. <filename>.closer()
   d. closefile.<fileobject>

22. Which method can not be used to read from files?
   a. read()
   b. readlines()
   c. readlines(<filename>)
   d. readline()

23. What does strip() function do?
   a. Removes the trailing or leading spaces, if any.
   b. Deletes the file
   c. Remove the file object
   d. Removes all the spaces between words
24. `readlines()` gives the output as
   a. List
   b. Tuple
   c. String
   d. Sets

25. When reading a file using the file object, what method is best for reading the entire file into a single string?
   a. `readline()`
   b. `read_file_to_str()`
   c. `read()`
   d. `readlines()`

26. Which file can open in any text editor and is in human readable form?
   a. Binary files
   b. Text files
   c. Data files
   d. Video files

27. Which function breaks the link of file-object and the file on the disk?
   a. `close()`
   b. `open()`
   c. `tell()`
   d. `readline()`

28. Which function reads the leading and trailing spaces along with trailing newline character ('\n') also while reading the line?
   a. `readlines()`
   b. `readline()`
   c. `read()`
   d. `flush()`

29. Which mode is used to retain its previous data and allowing to add new data?
   a. write mode
   b. read mode
   c. open mode
   d. append mode

30. Which function forces the writing of data on disc still pending in output buffer?
   a. `seek()`
   b. `tell()`
   c. `flush()`
   d. `write()`

31. Syntax for `flush()` function is:
   a. `<fileObject>(flush( ))`
   b. `flush(),<fileobject>`
   c. `<fileObject>.flush( )`
   d. `flush(),<file-object>`

32. Which function returns the entire file content in a list where each line is one item of the list?
   a. `readlines()`
33. Which function is used to remove the given character from trailing end i.e. right end?
   a. strip()
   b. remove()
   c. Istrip()
   d. rstrip()

34. Sometimes the last lap of data remains in buffer and is not pushed onto disk until a __________ operation is performed.
   a. dump()
   b. close()
   c. load()
   d. open()

35. The position of a file-pointer is governed by the__________.
   a. File mode
   b. append mode
   c. write mode
   d. open mode

36. In which mode the file must exist already, otherwise python raises an error? a. read mode
   b. write mode
   c. binary mode
   d. None of these

37. What is the prefix r stands for in file path?
   a. raw string
   b. read
   c. write
   d. append

38. In which mode_______ if the file does not exist, then the file is created?
   a. read write mode
   b. read mode
   c. write mode
   d. All of these

39. Which option is correct about this program?
   f=open(“ss.txt”,”wb”)
   print(“Name of the file:”,f.name)
   f.flush()
   f.close()
   a. Compilation error
   b. Runtime error
   c. No output
   d. Flushes the file when closing them

40. What is the output of the following?
   import sys
   sys.stdout.write(‘Hello\n’)
sys.stdout.write('Python\n')
a. error
b. Runtime error
c. Hello Python
d. Hello

Python

41. Which function is used to read all the characters in text files?
   a. read()
   b. readcharacters()
   c. readall()
   d. readchar()

42. Which function is used to read all the lines?
   a. read()
   b. readall()
   c. readlines()
   d. readline()

43. In which format does the readlines() function give the output?
   a. Integer type
   b. list type
   c. string type
   d. tuple type

44. In which format does the read() function give the output?
   a. Integer type
   b. string type
   c. list type
   d. tuple type

45. Which function is used to write a list of strings in a file?
   a. writestatement()
   b. writelines()
   c. writefulline()
   d. writeline()

46. Which function is used to write all the characters?
   a. writechar()
   b. writecharacters()
   c. write()
   d. writeall()

47. What is the correct syntax of open() function?
   a. file=open(file_name[,access_mode][,buffering])
   b. fileobject=open(file_name[,access_model][,buffering])
   c. fileobject=filename.open()
   d. none of the mentioned

48. In file handling, what does means “r”, “a”?
   a. append, read
b. read, append  
c. read, add  
d. None of the mentioned

49. The default file open mode is….
   a. w  
   b. r+  
   c. w+  
   d. r

50. What is the difference between r+ and w+ modes?  
a. In r+ mode, file length truncates to zero.  
b. In w+ mode, file length truncates to zero either file exists or not.  
c. No difference  
d. Depends on the operating system

51. A file maintains a __________ which tells the current position in the file where writing or reading will take place.  
a. line  
b. file pointer  
c. list  
d. order

52. Which of the following statements is true regarding the opening modes of a file?  
a. While opening a file for reading, if the file does not exist, an error occurs.  
b. While opening a file for writing, if the file does not exist, an error occurs.  
c. While opening a file for reading, if the file does not exist, a new file is created.  
d. None of the above.

53. To force python to write the contents of file buffer on to storage file, _________ method may be used.  
a. buffer()  
b. flush()  
c. close()  
d. write()

54. Which of the following statements are true?  
a) When you open a file for reading, if the file does not exist, an error occurs.  
b) When you open a file for writing, if the file does not exist, a new file is created.  
c) When you open a file for writing, if the file exists, the existing file content is overwritten with the new content.  
d) All of the these

55. To read the next line of the file from a file object f1, we use:  
a) f1.read(2)  
b) f1.read()  
c) f1.readline()  
d) f1.readlines()
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Q1. Which of the following commands is used to open a file “c:\temp.txt” in append-mode?

a. outfile - open("c:/temp.txt", “a”)
b. outfile - open("c:\temp.txt", “rw”)c. outfile - open("c:\temp.txt", “w+”)d. outfile - open("c:\temp.txt", “r+”)

Q2. What are the binary files used for?

a. It is used to store data in the form of bytes.
b. To store data
c. To look folder good
d. None of these

Q3. What is the function of `rb` mode in binary?

a. Both reading and writing operations can take place.
b. File is in only write mode.
c. File is created if it does not exist.
d. File must exist otherwise error will be shown.

Q4. What is the description of `r+b` in binary mode?

a. read and writeb. write and readc. read onlyd. none of these

Q5. What is binary file mode for append?

a. `rb`
b. `wb`c. `ab`d. None of these

Q6. What is the binary file mode associated with “file must exist, otherwise error will be raised and reading and writing can take place”.

a. read and writeb. write and readc. read onlyd. append
Q7. What is the process of converting a byte stream back to the original structure called?
   a. append  
   b. txt.file  
   c. Unpickling  
   d. None of these.

Q8. Which module is used to store data into python objects with their structure?
   a. pickle  
   b. binary files  
   c. unpickle  
   d. None of these

Q9. What is pickle.dump()?
   a. dump() function is used to store the object data to the file.  
   b. It is used to read  
   c. append  
   d. None of these

Q10. Which one of the following is the correct statement?
   a. pickle import  
   b. import - pickle  
   c. import pickle  
   d. None of the above

Q11. Which is the valid syntax to write an object onto a binary file opened in the write mode?
   a. pickle.dump(<object to be written>, <file handle of open file>)  
   b. pickle.dump(<file handle of open file>, <object to be written>)  
   c. dump.pickle(<object>, <file handle>)  
   d. None of the above

Q12. Which method is used for object serialization?
   a. Pickling  
   b. Unpickling  
   c. None of the above  
   d. All of the above

Q13. Which method of pickle module is used to read from a binary file?
   a. dump()  
   b. load()  
   c. All of the above  
   d. None of the above
Q14. Which method is used for object deserialization?
   a. Pickling
   b. Unpickling
   c. All of the above
   d. None of the above

Q15. Which of the following is the correct syntax to read from a file using load function?
   a. pickle.load(<filehandle>)
   b. <object> - load.pickle(<filehandle>)
   c. <object> - pickle.load(<filehandle>)
   d. All of the above

Q16. Which method of pickle module is used to write onto a binary file?
   a. dump()
   b. load()
   c. All of the above
   d. None of the above

Q17. Which of the following file modes open a file for reading and writing both in the binary file?
   a. r
   b. rb
   c. rwb
   d. rb+

Q18. Which of the following file modes that opens a file for reading and writing both and overwrites the existing file if the file exists otherwise creates a new file?
   a. w
   b. wb+
   c. rwb
   d. rb

Q19. Which of the following file modes opens a file for appending and reading in a binary file and moves the files pointer at the end of the file if the file already exists or creates a new file?
   a. .a
   b. .a+
   c. .ab+
   d. .ab

Q20. Which of the following file modes will not delete the existing data in binary file?
   a. .wb
   b. .w
   c. .a
   d. .ab
ANSWER KEY

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<td>9-A</td>
<td>14-B</td>
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<td>5-C</td>
<td>10-C</td>
<td>15-C</td>
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CSV FILES

Q1. _______ is a file format which stores records separated by comma.
   a. .tsv
   b. .csv
   c. .py
   d. .bin

Q2. The CSV files can be operated by _______ software.
   a. Spreadsheet
   b. Notepad
   c. MS Excel
   d. All of the above

Q3. When you read csv file using csv.reader() function it returns the values in _______ object.
   a. dictionary
   b. tuple
   c. nested list
   d. sets

Q4. CSV module allows to write multiple rows using ____________ function.
   a. writerows( )
   b. writerow( )
   c. writer( )
   d. None of the above

Q5. Which of the following parameter needs to be added with open function to avoid blank row followed file each row in CSV file?
   a. delimiter
   b. newline
   c. writer, delimiter
   d. file object
Q6. Which is the correct way to import a csv module?

a. import csv
b. from csv import *
c. None of the above
d. Both A & B

Q7. Observe the following code and fill the blank in statement 1

```python
import csv
with ______ as f: #statement1
    r = csv.______(f) #statement2
    for row in ______: #statement3
        print(_____) #statement4
```

a. open("data.csv")
b. f=open("data.csv")
c. Both A & B are Correct
d. Both A & B are incorrect

Q8. Observe the following code and fill the blank in statement 2

```python
import csv
with ______ as f: #statement1
    r = csv.______(f) #statement2
    for row in ______: #statement3
        print(_____) #statement4
```

a. load
b. read()
c. reader()
d. readlines()

Q9. Observe the following code and fill the blank in statement 3

```python
import csv
with ______ as f: #statement1
    r = csv.______(f) #statement2
    for row in ______: #statement3
        print(_____) #statement4
```

a. f
b. r
c. r,f
d. None of the above
Q10. Observe the following code and fill the blank in statement4

```python
import csv

with _________ as f: #statement1
    r = csv.______(f) #statement2

for row in ______: #statement3
    print(_____) #statement4
```

a. r  
b. row  
c. f  
d. csv

**ANSWER KEY**

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**Key Point on Data Structure**

**Data structure**: The logical or mathematical model of a particular organization of data is called data structure. It is a way of storing, accessing, and manipulating data. List: An array or list is the collection of elements in an ordered way.

**Stack**: It is a linear data structure. May be inserted or deleted only at one end, called the TOP of the stack. It follows the principle Last In First Out (LIFO).

**There are two basic operations with stack**:

- **Push()**: Insert the element in stack
- **Pop**: Delete the element from stack

---

**Data Structure**

1. _______________ is a way to represent data in memory.
   a. Data Handling  
   b. Data Structure  
   c. Data Dumping  
   d. Data Collection

2. Python built-in data structures are
   a. integer, float, string  
   b. list, tuple, dictionary, sets  
   c. math, pyplot
3. Data structure can be of two type’s namely___________
   a. Simple and Compound
   b. Simple and Nested
   c. Sequential and random
   d. All of the above
4. Array or linear list comes under the category of______
   a. Simple Data Structure
   b. Compound Data Structure
   c. random
   d. None of these
5. Compound Data structure can be ______ & ______
   a. Sequential and random
   b. Simple & Nested
   c. Linear & Non Linear
6. The examples of Linear Data Structures are
   a. Stacks,Queues,Linked list
   b. int,float,complex
   c. Operators,tokens,punctuators
7. Stacks follows___________ order
   a. FIFO (First In First Out )
   b. LIFO (Last In First Out)
   c. Random
8. Queue follows___________ order
   a. FIFO (First In First Out )
   b. LIFO (Last In First Out)
   c. Random
9. Main Operations in Stacks are called
   a. Insertion and deletion
   b. append and insertion
   c. Push and Pop
10. Main Operations in Queue are called
    a. Insertion and deletion
    b. append and insertion
    c. Push and Pop
11. In Stack Insertion and deletion of an element is done at single end called ________
    a. Start
    b. Last
    c. Top
    d. Bottom
12. In a stack, we cannot insert an element in between the elements that are already inserted.
   a. True
   b. False

13. The process of visiting each element in any Data structure is termed as _____________
   a. Visiting
   b. Searching
   c. Traversing
   d. Movement

14. While implementing Stack using list when we want to delete element we must use pop function
   as_________
   a. list.pop(pos)
   b. list.pop(0)
   c. list.pop()

15. Arranging elements of a data structure in increasing or decreasing order is known as________
   a. Searching
   b. Arrangement
   c. Sorting
   d. Indexing

16. Searching of any element in a data structure can be done in 2 ways ___________ and _________
   a. Sequential and random
   b. linear and non linear
   c. linear and binary

17. ________ is an example of nonlinear data structure
   a. Stack
   b. Queue
   c. Sorting
   d. Tree

18. In a stack, if a user tries to remove an element from empty stack it is called ___________
   a. Underflow
   b. Empty
   c. Overflow
   d. Garbage Collection

19. What is the value of the postfix expression 6 3 2 4 + – *
   a. 1
   b. 40
   c. 74
   d. -18
20. If the elements “A”, “B”, “C” and “D” are placed in a stack and are deleted one at a time, in what order will they be removed?
   a. ABCD
   b. DCBA
   c. DCAB
   d. ABDC

21. Which of the following data structure is linear type?
   a. Stack
   b. Array
   c. Queue
   d. All of the above

22. The postfix form of the expression \((A + B) \times (C \times D - E) \times F / G\) is?
   a. \(AB + CDE \times - \times F \times G /\)
   b. \(AB+ CD*E - FG /**\)
   c. \(AB + CD* E - F **G /\)
   d. \(AB + CD* E - *F *G /\)

23. The postfix form of \(A \times B + C / D\) is?
   a. \(*AB/CD+\)
   b. \(AB*CD/+\)
   c. \(A*BC+/D\)
   d. \(ABCD+/*)

24. Which of the following statement(s) about stack data structure is/are NOT correct?

   Stack data structure can be implemented using linked list
   New node can only be added at the top of the stack
   Stack is the FIFO data structure
   The last node at the bottom of the stack has a NULL link

   1.B
   2.B
   3.A
   4.A
   5.C

   6.A
   7.B
   8.A
   9.C
   10.A

   11.C
   12.A
   13.C
   14.C
   15.C

   16.C
   17.D
   18.A
   19.D
   20.B

   21.D
   22.B
   23.B
   24.C
   25
Accession and Reasoning
1. Amit, a student of class 12th, is learning CSV File Module in Python. During examination, he has been assigned an incomplete python code (shown below) to create a CSV File 'School.csv' (content shown below). Help him in completing the code which creates the desired CSV File.

CSV File

1. AKASH, XII, A
2. AKRITI, XII, A
3. ISHA, XII, A
4. RASHI, XII, A
5. SEJAL, XII, A

Incomplete Code

import_____ #Statement-1
fh = open(_____, _____, newline='') #Statement-2
stuwriter = csv._____ #Statement-3
data = []
header = ['ROLL_NO', 'NAME', 'CLASS', 'SECTION']
data.append(header)
for i in range(5):
    roll_no = int(input("Enter Roll Number : "))
    name = input("Enter Name : ")
    Class = input("Enter Class : ")
    section = input("Enter Section : ")
    rec = [_____] #Statement-4
data.append(rec)
stuwriter._____ (data) #Statement-5
fh.close()

i. Identify the suitable code for blank space in line marked as Statement-1.
   a) csv file
   b) CSV
   c) csv
   d) Csv

Correct Answer: c) csv

ii. Identify the missing code for blank space in line marked as Statement-2?
   a) "School.csv","w"
   b) "Student.csv","w"
   c) "Student.csv","r"
   d) "School.csv","r"

Correct Answer: a) "School.csv","w"

iii. Choose the function name (with argument) that should be used in the blank pace of line marked as Statement-3
   a) reader (fh)
   b) reader (MyFile)
   c) writer (fh)
   d) writer (MyFile)

Correct Answer: c) writer (fh)

iv. Identify the suitable code for blank space in line marked as Statement-4.
   a) 'ROLL_NO', 'NAME', 'CLASS', 'SECTION'
   b) ROLL_NO, NAME, CLASS, SECTION
   c) 'roll_no','name','Class','section'
   d) roll_no,name,Class,section

Correct Answer: d) roll_no,name,Class,section
v. Choose the function name that should be used in the blank space of line marked as Statement-5 to create the desired CSV File?

a) dump( )

b) load( )

c) writerows( )

d) writerow( )

Correct Answer: c) writerows( )

2: Amritya Seth is a programmer, who has recently been given a task to write a python code to perform the following binary file operations with the help of two user defined functions/modules:
a. AddStudents() to create a binary file called STUDENT.DAT containing student information – roll number, name and marks (out of 100) of each student.

b. GetStudents() to display the name and percentage of those students who have a percentage greater than 75. In case there is no student having percentage > 75 the function displays an appropriate message. The function should also display the average percent.

He has succeeded in writing partial code and has missed out certain statements, so he has left certain queries in comment lines. You as an expert of Python have to provide the missing statements and other related queries based on the following code of Amritya.

Answer any four questions (out of five) from the below mentioned questions.
import pickle

def AddStudents():

    _________ #1 statement to open the binary file to write data

    while True:

        Rno = int(input("Rno :"))

        Name = input("Name : ")

        Percent = float(input("Percent :"))

        L = [Rno, Name, Percent]

        _________ #2 statement to write the list L
into the file
Choice = input("enter more (y/n): ")
if Choice in "nN":
break
F.close()
def GetStudents():
    Total=0
    Countrec=0
    Countabove75=0
    with open("STUDENT.DAT","rb") as F:
        while True:
            try:
                #3 statement to read from the file
                Countrec+=1
                Total+=R[2]
                if R[2] > 75:
                    print(R[1], " has percent = ",R[2])
                    Countabove75+=1
            except:
                break
if Countabove75==0:
print("There is no student who has
percentage more than 75")

average=Total/Countrec

print("average percent of class = ",average)

AddStudents( )

GetStudents( )

i. Which of the following commands is used to open the file “STUDENT.DAT” for writing only in binary format? (marked as #1 in the Python code)
   a. F= open("STUDENT.DAT",'wb')
   b. F= open("STUDENT.DAT",'w')
   c. F= open("STUDENT.DAT",'wb+')
   d. F= open("STUDENT.DAT",'w+')

Correct Answer: a. F= open("STUDENT.DAT",'wb')

ii. Which of the following commands is used to write the list L into the binary file, STUDENT.DAT? (marked as #2 in the Python code)
   a. pickle.write(L,f)
   b. pickle.write(f, L)
   c. pickle.dump(L,F)
   d. f=pickle.dump(L)

Correct Answer: c. pickle.dump(L,F)

iii. Which of the following commands is used to read each record from the binary file STUDENT.DAT? (marked as #3 in the Python code)
   a. R = pickle.load(F)
   b. pickle.read(r,f)
   c. r= pickle.read(f)
   d. pickle.load(r,f)

Correct Answer: a. R = pickle.load(F)
iv. Which of the following statement(s) are correct regarding the file access modes?

a. ‘r+’ opens a file for both reading and writing. File object points to its beginning.

b. ‘w+’ opens a file for both writing and reading. Adds at the end of the existing file if it exists and creates a new one if it does not exist.

c. ‘wb’ opens a file for reading and writing in binary format. Overwrites the file if it exists and creates a new one if it does not exist.

d. ‘a’ opens a file for appending. The file pointer is at the start of the file if the file exists.

Correct Answer: a

v. Which of the following statements correctly explain the function of seek() method?

a. tells the current position within the file.

b. determines if you can move the file position or not.

c. indicates that the next read or write occurs from that position in a file.

d. moves the current file position to a given specified position

Correct Answer: d

*************************
### General Instructions:
1. This question paper contains two parts A and B. Each part is compulsory.
2. Both Section A and Section B have choices.
3. Section - A has 35 MCQ/True or False questions of 1 marks each. Any 27 questions to be answered.
4. Section – B has 2 questions, each question includes 5 MCQ questions, Attempt any 4 questions.

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<th>Ques No.</th>
<th>Section-I</th>
<th>Mark s Allotted</th>
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<tr>
<td>1</td>
<td>Consider a list $L = [5, 10, 15, 20]$, which of the following will result in an error: a) $L[0] += 3$ b) $L += 3$ c) $L *= 3$ d) $L[1] = 45$</td>
<td>1</td>
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<tr>
<td>2</td>
<td>Find the operator which cannot be used with a string in Python from the following: a) // b) * c) + d) in</td>
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<td>3</td>
<td>Consider a tuple in python named $Months = ('Jul', 'Aug', 'Sep')$. Identify the invalid statement(s) from the given below statements: a) $S = Months[0]$ b) $print(Months[2])$ c) $Months[1] = 'Oct'$ d) $LIST1 = list(Months)$</td>
<td>1</td>
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<td>4</td>
<td>Functions that do not return any value are known as: a) Fruitful functions b) Void functions c) Standard python functions d) User-defined functions</td>
<td>1</td>
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<tr>
<td>6</td>
<td>Which of the following is a wrong way of defining a function: a) $def f(x=10, y=20, z=30)$ b) $def f(x, y, z)$ c) $def f(x=10, y)$ d) $def f(x, y=20, z=30)$</td>
<td>1</td>
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<td>7</td>
<td>A void function also returns a __________ value to its caller. a) Correct b) Incorrect</td>
<td>1</td>
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<td>8</td>
<td>What is the area of memory called, which stores the parameters and local variables of a function call? a) Heap b) Queue c) Stack d) Array</td>
<td>1</td>
</tr>
</tbody>
</table>
| 9        | Rohan wants to drive a car but he is unable to drive because his age is below 18. A python code is written to check his age. Identify it is correct or incorrect.

```python
Age = input("enter age:")
if age <= 18:
    print("you are not eligible")
```
a) Correct b) Incorrect | 1 |
| 10       | CSV stands for a) Column Separated Values b) Comma Separated Values c) Column Separated Values d) Column Separated Values | 1 |
| 11       | What is the output of the function shown below (random module has already been imported)? $print(random.choice('sun'))$ a) Sun b) U c) Either s, u or n d) Error | 1 |
| 12       | What is the default mode of opening a file in python? a) read b) write c) append d) read and write | 1 |
| 13       | Which of the following expressions is an example of type casting? a) $4.0 + float(6)$ b) $5.3 + 6.3$ c) $5.0 + 3$ d) None of these | 1 |
| 14       | To read twelve characters from a file object $f1$, we use a) $f1.read(12)$ b) $f1.read()$ c) $f1.readline()$ d) $read(f1,12)$ | 1 |
| 15       | In which of the following file modes, the existing data of file will not be lost? a) wb+ b) wb c) rb d) w+ | 1 |
| 16       | What is the output of the following Python Code; Select any one of the following options? $import random$ $print(int(random.random())*5)$ a) Always generate 0 | 1 |
b) Generate any number between 0 to 4 (including both)  
c) Generate any number between 0 to 5 (including both)  

17 Which of the following is a valid variable name?  
a) Student name  
b) 3Number  
c) %name%  
d) Block_number

18 What will be the output after the following statements?  
```python  
a = [0, 1, 2, 3]  
del a[:];  
print(a)  
```

a) None  
b) []  
c) [0, 1, 2, 3]  
d) NameError

19 What will be the output after the following statements?  
```python  
x = 27  
y = 9  
while x < 30 and y < 15:  
    x = x + 1  
    y = y + 1  
print(x, y)  
```

a) 26 11  
b) 25 11  
c) 30 12  
d) 26 10

20 What will the following code produce?  
```python  
T = ['kvs', 'rpr']  
T1 = range(len(T))  
for i in T1:  
    T[i] = T[i].upper()  
print(T)  
```

a) ['KVS', 'RPR']  
b) ['kvs', 'rpr']  
c) ['Kvs', 'Rpr']  
d) Error

21 Find out the type of error if any:  
```python  
if v < 5:  
    print("KVS")  
else:  
    print("CBSE")  
```

a) No Error  
b) Declaration of v  
c) with else not required  
d) Indentation Error

22 Consider square numbers defined as follows:  
compute(1) = 1  
compute(N) = compute(N-1) + 2N-1  
According to this definition, what is compute(3)?  
a) compute(3) = compute(2) + compute(1)  
b) compute(3) = compute(2) - 2*3+1  
c) compute(3) = compute(2) + 2*3-1  
d) compute(3) = compute(3) + 2*3-1

23 When you open a file for writing, if the file does not exist, an error occurs. (True/False)

24 The relative path for a file always remains same even after changing the directory. (True/False)

25 The value of the expressions `4/(3*(4-2))` and `4/3*(4-2)` is the same. (True/False)

26 The command to merge the dictionary `Book` with `Library` the command would be:  
a) `d = Book + Library`  
b) `print(Book + Library)`  
c) `Book.update(Library)`  
d) `Library.update(Book)`

27 Identify the correct option to add new value 50 to existing tuple T  
T = (11, 22, 33, 44, 55)  
a) T = T + 66  
b) T = T + 66  
c) T = T + (66,)  
d) T = T + (66)

28 Find and write the output of the following python code:  
```python  
a = 10  
def call():  
    global a  
    a = 15  
b = 20  
print(a)  
call()  
```

a) 25  
b) 35  
c) 15  
d) 10

29 Which of the following Python codes will result in an error?  
```python  
object = "a"  
```

1

| Page | 59 |
a) pickle.dumps(object)  
 b) pickle.dumps(object, 3)  
 c) pickle.dumps(object, 3, True)  
 d) pickle.dumps('a', 2)  

30  if is a ______ and roll_no is a/an __________________.  

31  if a = [5,4,3,2,2,1], evaluation of the expression a[ a[ a[ a[ 2 ] + 1 ] ] ]:
   a) 3  
   b) 4  
   c) 5  
   d) 2  

32  What is the output of the following program:
   print(0.1 + 0.2 == 0.3)  
   a) True  
   b) False  
   c) Machine Dependent  
   d) Error  

33  What will be the output after the following statements?  
   x = 0  
   y = 4  
   while x + y < 10:  
       print(x, end=')  
   x += 2  
   a) 0 2 4 6  
   b) 0 2 4  
   c) 0 2  
   d) 0 2 4 8  

34  apple = 'red'  
   def fruit():  
     pineapple = 'green'  
   In above code apple is a ___________ variable while pineapple is a ___________ variable.  

35  Which of the following is the use of id() function in Python?  
   a) Id returns the identity of the object  
   b) Every object doesn’t have a unique ID  
   c) All of the mentioned  
   d) None of the mentioned  

Section-II (Case Study Based Question)  

36  Rohit, a student of class 12th, is learning CSV File Module in Python. During examination, he has been assigned an incomplete python code (shown below) to create a CSV File 'Student.csv' (content shown below). Help him in completing the code which creates the desired CSV File.  

CSV File  
1, AKSHAY, XII, A  
2, ABHISHEK, XII, A  
3, ARVIND, XII, A  
4, RAVI, XII, A  
5, ASHISH, XII, A  

Incomplete Code  
import ______ #Statement-1  
fh = open(_____, _____, newline='') #Statement-2  
stuwriter = csv._____ #Statement-3  
data = []  
header = ['ROLL_NO', 'NAME', 'CLASS', 'SECTION']  
data.append(header)  
for i in range(5):  
    roll_no = int(input("Enter Roll Number : "))  
    name = input("Enter Name : ")  
    Class = input("Enter Class : ")  
    section = input("Enter Section : ")  
    rec = [_____] #Statement-4  
data.append(rec)  
stuwriter. _____ (data) #Statement-5  
fh.close()  

Answer any four of the following questions.  

i)  Identify the suitable code for blank space in line marked as Statement-1  
   a) csv file  
   b) CSV  
   c) csv  
   d) Csv  

ii) Identify the missing code for blank space in line marked as Statement-2?  
   a) "School.csv", "w"  
   b) "Student.csv", "w"  
   c) "Student.csv", "r"  
   d) "School.csv", "r"  

iii) Choose the function name (with argument) that should be used in the blank space of line marked as Statement-3  
   a) reader(fh)  
   b) reader(MyFile)  
   c) writer(fh)  
   d) writer(MyFile)
### Identify the suitable code for blank space in line marked as Statement-4.

- a) `'ROLL_NO', 'NAME', 'CLASS', 'SECTION'`  
- b) `'ROLL_NO', 'NAME', 'CLASS', 'SECTION'`  
- c) `'roll_no','name','Class','section'`  
- d) `'roll_no','name','Class','section'`  

### Choose the function name that should be used in the blank space of line marked as Statement-5 to create the desired CSV File?

- a) `dump()`  
- b) `load()`  
- c) `writerows()`  
- d) `writerow()`  

---

Your teacher has given you a method/function `FilterWords()` in python which read lines from a text file `Newsletter.TXT`, and display those words, which are lesser than 4 characters. Your teachers intentionally kept few blanks in between the code and asked you to fill the blanks so that the code will run to find desired result. Do the needful with the following python code.

```python
def FilterWords():
    c=0
    file=open('Newsletter.TXT', '_____') #Statement-1
    line = file._____ #Statement-2
    word = _____ #Statement-3
    for c in word:
        if _____: #Statement-4
            print(c)
    __________ #Statement-5
FilterWords()```

Answer any 4 of the following questions.

### Write mode of opening the file in statement-1?

- a. a  
- b. ab  
- c. w  
- d. r  

### Fill in the blank in statement-2 to read the data from the file.

- a. File.Read()  
- b. file.read()  
- c. read.lines()  
- d. readlines()  

### Fill in the blank in statement-3 to read data word by word.

- a. Line.Split()  
- b. Line.split()  
- c. line.split()  
- d. split.word()  

### Fill in the blank in statement-4, which display the word having lesser than 4 characters.

- a. `len(c) ==4`  
- b. `len(c)<4`  
- c. `len ( )= =3`  
- d. `len ( )==3`  

### Fill in the blank in Statement-5 to close the file.

- a. file.close()  
- b. File.Close()  
- c. Close()  
- d. end()
**KENDRIYA VIDYALAYA SANGATHAN, RAIPUR REGION**  
**TERM END EXAMINATION (ONE) 2021-22**  
**Marking Scheme**  

**Class – XII**  
**SUB-Computer Sc.**

<table>
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<th>Section-I</th>
<th>Marks Allotted</th>
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<td>global, local</td>
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<td>35</td>
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**Section-II (Case Study Based Question)**

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<tr>
<td>i)</td>
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<td>iii)</td>
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<td>v)</td>
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<table>
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<th>37 Any Four</th>
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<td>iv)</td>
<td>b</td>
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<tr>
<td>v)</td>
<td>a</td>
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General Instructions to the Examinee:

1. This question paper contains two parts A and B. Each part is compulsory.
2. Both Part A and Part B have choices.
3. Part-A is having MCQs (Attempt 27 out of 35 questions).
4. Part-B has two Case based questions.
   a. Each case study has 4 case-based subparts. 
   b. An examinee is to attempt any 4 out of the 5 subparts.
5. All programming questions are to be answered using Python Language only.

Part-A
(Attempt any 27 questions from question no 1 to 35.)

1. What possible output(s) are expected to be displayed on screen at the time of execution of the program from the following code?
   from random import randint
   LST=[5,10,15,20,25,30,35,40,45,50,60,70]
   first = randint(3,8) – 1
   second = randint(4,9) – 2
   third = randint(6,11) – 3
   print(LST[first],"#", LST[second],"#", LST[third],"#")
   a) 20#25#25#
   b) 30#40#70#
   c) 15#60#70#
   d) 35#40#60#

2. Specify the maximum values that can be assigned to each of the variables first, second and third in the code given in Question no. 1 -
   a) First: 6, Second: 6, Third: 7
   b) First: 7, Second: 7, Third: 8
   c) First: 3, Second: 4, Third: 6
   d) First: 8, Second: 8, Third: 9

3. Which of the following is not a valid identifier name in Python?
   (a) First_Name                   (b) _Area
   (c) 2nd_num                      (d) While

4. Which statement is correct for dictionary?
   (a) A dictionary is an ordered set of key:value pair
   (b) each of the keys within a dictionary must be unique
   (c) each of the values in the dictionary must be unique
   (d) values in the dictionary are immutable

5. Identify the valid declaration of Record:
   Record=(1342, “Pooja”, 45000, “Sales”)
   (a) List
   (b) Tuple
   (c) String
   (d) Dictionary

6. Which of the following functions do we use to write data in a binary file?
   (a) writer( )
   (b) output( )
   (c) dump( )
   (d) send( )
7. Which operator is used for replication?
   (a) +
   (b) %
   (c) *
   (d) //

8. Which of the following functions generates an integer?
   (a) uniform()
   (b) randint()
   (c) random()
   (d) None of the above

   Identify the invalid statement(s) from the given below statements:
   (a) S=DAYS[1]
   (b) print(DAYS[2])
   (c) DAYS[0]= “WED”
   (d) LIST=list(DAYS)

10. t1=(2,3,4,5,6)
    print(t1.index(4))
    Output will be –
        (a) 4
        (b) 5
        (c) 6
        (d) 2

11. Which of the following statements correctly explain the function of tell() method?
    (a) tells the current position within the file.
    (b) tell the name of file.
    (c) move the current file position to a different location.
    (d) it changes the file position only if allowed to do so else returns an error.

12. Which of the following statements correctly explain the function of seek() method?
    (a) tell the current position within the file.
    (b) indicate that the next read or write occurs from that position in a file.
    (c) determine if you can move the file position or not.
    (d) move the current file position to a different location at a defined offset.

13. Which of the following command is used to open a file “c:\temp.txt” in read-mode only?
    (a) infile = open(“c:\temp.txt”, “r”)
    (b) infile = open(“c:\temp.txt”, “r”)  
    (c) infile = open(file = “c:\temp.txt”, “r+”)  
    (d) infile = open(file = “c:\temp.txt”, “r+”)

14. Which of the following command is used to open a file “c:\temp.txt” in write-mode only?
    (a) outfile = open(“c:\temp.txt”, “w”)
    (b) outfile = open(“c:\temp.txt”, “w”)  
    (c) outfile = open(file = “c:\temp.txt”, “w+”)  
    (d) outfile = open(file = “c:\temp.txt”, “w+”)

<table>
<thead>
<tr>
<th>Question Number</th>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.</td>
<td>Which of the following command is used to open a file “c:\temp.txt” in append-mode?</td>
<td>(a) outfile = open(&quot;c:\temp.txt&quot;, &quot;a&quot;)</td>
</tr>
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<td></td>
<td></td>
<td>(b) outfile = open(&quot;c:\temp.txt&quot;, &quot;rw&quot;)</td>
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<td></td>
<td></td>
<td>(c) outfile = open(&quot;c:\temp.txt&quot;, &quot;w+&quot;)</td>
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<td></td>
<td>(d) outfile = open(&quot;c:\temp.txt&quot;, &quot;r+&quot;)</td>
</tr>
<tr>
<td>16.</td>
<td>Which of the following commands can be used to read “n” number of characters from a file using the file object &lt;file&gt;?</td>
<td>(a) file.read(n)</td>
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<td>(b) n = file.read()</td>
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<td></td>
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<td>(c) file.readline(n)</td>
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<td></td>
<td></td>
<td>(d) file.readlines()</td>
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<tr>
<td>17.</td>
<td>Which of the following commands can be used to read the entire contents of a file as a string using the file object &lt;tmpfile&gt;?</td>
<td>(a) tmpfile.read(n)</td>
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<td>(b) tmpfile.read()</td>
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<td></td>
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<td>(c) tmpfile.readline()</td>
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<td>(d) tmpfile.readlines()</td>
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<tr>
<td>18.</td>
<td>Which of the following commands can be used to read the remaining lines in a file using the file object &lt;tmpfile&gt;?</td>
<td>(a) tmpfile.read(n)</td>
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<td>(b) tmpfile.read()</td>
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<td>(c) tmpfile.readline()</td>
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<td></td>
<td>(d) tmpfile.readlines()</td>
</tr>
<tr>
<td>19.</td>
<td>Which of the following statement is False regarding the opening modes of a file?</td>
<td>(a) When you open a file for reading, if the file does not exist, an error occurs.</td>
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<td>(b) When you open a file for reading, if the file does not exist, the program will open an empty file.</td>
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<td></td>
<td>(c) When you open a file for writing, if the file does not exist, a new file is created.</td>
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<td></td>
<td>(d) When you open a file for writing, if the file exists, the existing file is overwritten with the new file.</td>
</tr>
<tr>
<td>20.</td>
<td>Which module is required to use built in function dump()</td>
<td>(a) Math                                  (b) pickle</td>
</tr>
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<td></td>
<td>(c) pickle                                  (d) csv</td>
</tr>
<tr>
<td>21.</td>
<td>Which of the following function is used to write data in binary mode?</td>
<td>(a) write                                  (b) output</td>
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<td></td>
<td>(c) dump                                    (d) send</td>
</tr>
<tr>
<td>22.</td>
<td>To read 2 characters from file object f1 command should be</td>
<td>(a) f1.read(2)</td>
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<td></td>
<td>(b) f1.read()</td>
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<td>(c) f1.readline()</td>
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<td></td>
<td></td>
<td>(d) f1.readlines()</td>
</tr>
<tr>
<td>23.</td>
<td>To get byte position from the beginning of file, function used is</td>
<td>(a) seek                                    (b) tell</td>
</tr>
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<td></td>
<td></td>
<td>(c) read                                    (d) write</td>
</tr>
<tr>
<td>24.</td>
<td>The file pointer, used to go to particular position</td>
<td>(a) seek                                    (b) tell</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(c) read                                    (d) write</td>
</tr>
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25. In regards to separated value files such as .csv and .tsv, what is the delimiter?
   (a) Any character such as the comma (,) or tab (\t) that is used to separate the column data.
   (b) Delimiters are not used in separated value files
   (c) Anywhere the comma (,) character is used in the file
   (d) Any character such as the comma (,) or tab (\t) that is used to separate the row data

26. In separated value files such as .csv and .tsv, what does the first row in the file typically contain?
   (a) The author of the table data
   (b) The source of the data
   (c) Notes about the table data
   (d) The column names of the data

27. Assume you have a file object my_data which has properly opened a separated value file that uses the tab character (\t) as the delimiter. What is the proper way to open the file using the Python csv module and assign it to the variable csv_reader? Assume that csv has already been imported.
   (a) csv.tab_reader(my_data)
   (b) csv.reader(my_data)
   (c) csv.reader(my_data, delimiter='\t')
   (d) csv.reader(my_data, tab_delimited=True)

28. When iterating over an object returned from csv.reader(), what is returned with each iteration? For example, given the following code block that assumes csv_reader is an object returned from csv.reader(), what would be printed to the console with each iteration?
   ```python
   for item in csv_reader:
       print(item)
   ```
   (a) The full line of the file as a string
   (b) The row data as a list
   (c) The individual value data that is separated by the delimiter
   (d) The column data as a list

29. Find the output of the following:
   >>> Line = "Fun with Python"
   >>> print (Name [: 5 : -1])
   (a) ith Python
   (b) th Python
   (c) nohtyP ht
   (d) nohty

30. What will be the Output for the following code –
    Language=['"C", "C++", "JAVA", "Python", "VB", "BASIC", "FORTRAN"]
    del Language[4]
    Language.remove("JAVA")
    Language.pop(3)
    print(Language)
    (a) ['C', 'C++', 'VB', 'FORTRAN']
    (b) ['C', 'C++', 'Python', 'FORTRAN']
    (c) ['C', 'C++', 'BASIC', 'FORTRAN']
    (d) ['C', 'C++', 'Python', 'BASIC']
31. An absolute path name begins at the _____________
   (a) Leaf
   (b) Stem
   (c) current directory
   (d) root

32. What happens if a local variable exists with the same name as the global variable you want to access?
   (a) Error
   (b) The local variable is shadowed
   (c) Undefined behavior
   (d) The global variable is shadowed

33. Choose the correct option with reference to below Python code?

```python
def fn(a):
    print(a)
x=90
fn(x)
```

(a) x is the formal argument.
(b) a is the actual argument.
(c) fn(x) is the function signature.
(d) x is the actual argument.

34. What is the output of the following –
print(21/9%3, 2**2**3)

(a) 7  64
(b) 2  256
(c) 7 256
(d) 2 64

35. Assertion (A) : Keys in a Python dictionary should be unique.
Reason (R) : Only immutable data types can be used as keys.

(a) A is true but R is false.
(b) A is false but R is true.
(c) Both A and R are false.
(d) Both A and R are true but R is not the correct explanation of A.
(e) Both A and R are true and R is the correct explanation of A.

Part-B

(Attempt any 4 out of the 5 subparts in each question)

36. In an online lottery system, names having exactly 5 characters are to be displayed. Piyush has been asked to complete this task. He has created a function FindNames() in python which read contents from a text file LOTTERY.TXT, which contains names of participants, and displays those names, which are having exactly 5 characters. He got confused with few statements and left it blank. Help him complete the code.

```python
def FindNames():
    c=0
    file=open('LOTTERY.TXT', '_____') #Statement-1
    line = file._____ #Statement-2
    word = _____ #Statement-3
    for c in word:
        if _____: #Statement-4
            print(c)
    _____ #Statement-5
FindNames()```
(i) Write mode of opening the file in statement-1?
   (a) A
   (b) Ab
   (c) W
   (d) r

(ii) Fill in the blank in statement-2 to read the data from the file.
    (a) File.Read()
    (b) file.read()
    (c) read.lines()
    (d) readlines()

(iii) Fill in the blank in statement-3 to read data word by word.
     (a) Line.Split()
     (b) Line.split()
     (c) line.split()
     (d) split.word()

(iv) Fill in the blank in statement-4, which display the word having exactly 5 characters.
     (a) len(c) ==5
     (b) len(c)<5
     (c) len ( )= =5
     (d) len ( )==6

(v) Fill in the blank in Statement-5 to close the file.
     (a) file.close()
     (b) File.Close()
     (c) Close()
     (d) end()

37. Snigdha is making a software on “Countries & their Capitals” in which various records are to be stored/retrieved in CAPITAL.CSV data file. It consists some records (Country & Capital). She has written the following code in python. As a programmer, you have to help her to successfully execute the program.

```python
import ___________ # Statement-1
def AddNewRec(Country,Capital): # Fn. to add a new record in CSV file
    f=open("CAPITAL.CSV",_________) # Statement-2
    fwriter=csv.writer(f)
    fwriter.writerow([Country,Capital]) # Statement-3

def ShowRec(): # Fn. to display all records from CSV file
    with open("CAPITAL.CSV","r") as NF:
        NewReader=csv.___________(NF) # Statement-4
        for rec in NewReader:
            print(rec[0], "#", rec[1])

AddNewRec("INDIA", "NEW DELHI")
AddNewRec("CHINA", "BEIJING")
ShowRec() # Statement-5
```
(i) Which module should be imported in Statement-1.
   (a) pickle
   (b) csv
   (c) file
   (d) text

(ii) Which file mode to be passed to add new record in Statement-2.
    (a) w+
    (b) w
    (c) wb
    (d) a

(iii) What should be written in Statement-3 to close the file?
     (a) close()
     (b) fwriter.close()
     (c) f.close()
     (d) csv.close()

(iv) Which function to be used in Statement-4 to read the data from a csv file.
     (a) read()
     (b) readline()
     (c) readlines()
     (d) reader()

(v) The output after executing Statement-5 will be –
    (a) (“INDIA”, “NEW DELHI”)  
      (“CHINA”, “BEIJING”)  
    (b) INDIA NEW DELHI  
      CHINA BEIJING  
    (c) INDIA, NEW DELHI  
      CHINA, BEIJING  
    (d) INDIA # NEW DELHI  
      CHINA # BEIJING

----------All the Best----------
KENDRIYA VIDYALAYA SANGATHAN, RAIPUR REGION  
Term-I Examination – 2021-22  
Set-2 Answer Key  
Class- XII, Subject – Computer Science (083)

Duration: 90 mins. MM: 35

General Instructions to the Examinee:

1. This question paper contains two parts A and B. Each part is compulsory.
2. Both Part A and Part B have choices.
3. Part-A is having MCQs (Attempt 27 out of 35 questions).
4. Part- B has two questions based on Case studies.
   a. Each case study has 4 case-based subparts.
   b. An examinee is to attempt any 4 out of the 5 subparts.
5. All programming questions are to be answered using Python Language only.

Part-A  
(Attempt any 27 questions from question no 1 to 35.)

1. What possible output(s) are expected to be displayed on screen at the time of execution of the program from the following code?

from random import randint
LST=[5,10,15,20,25,30,35,40,45,50,60,70]
first = randint(3,8) – 1
second = randint(4,9) – 2
third = randint(6,11) – 3
print(LST[first],"#", LST[second],"#", LST[third],"#")

   a) 20#25#25#  
   b) 30#40#70#  
   c) 15#60#70#  
   d) 35#40#60#

2. Specify the maximum values that can be assigned to each of the variables first, second and third in the code given in Question no. 1 -

   a) First: 6, Second: 6, Third: 7  
   b) First: 7, Second: 7, Third: 8  
   c) First: 3, Second: 4, Third: 6  
   d) First: 8, Second: 8, Third: 9

3. Which of the following is not a valid identifier name in Python?

   (a) First_Name  
   (b) _Area  
   (c) 2nd_num  
   (d) While

4. Which statement is correct for dictionary?

   (a) A dictionary is an ordered set of key:value pair  
   (b) each of the keys within a dictionary must be unique  
   (c) each of the values in the dictionary must be unique
5. Identify the valid declaration of **Record**:
   Record=(1342, “Pooja”, 45000, “Sales”)
   (a) List  
   (b) **Tuple**  
   (c) String  
   (d) Dictionary  

6. Which of the following functions do we use to write data in a binary file?
   (a) writer( )  
   (b) output( )  
   (c) **dump( )**  
   (d) send( )  

7. Which operator is used for replication?
   (a) +  
   (b) %  
   (c) *  
   (d) //</br>  

8. Which of the following functions generates an integer?
   (a) uniform( )  
   (b) **randint( )**  
   (c) random( )  
   (d) None of the above  

   Identify the invalid statement(s) from the given below statements:
   (a) S=DAYS[1]  
   (b) print(DAYS[2])  
   (c) **DAYS[0]= “WED”**  
   (d) LIST=list(DAYS)  

10. t1=(2,3,4,5,6)
    print(t1.index(4))
    Output will be –
    (a) 4  
    (b) 5  
    (c) 6  
    (d) **2**  

11. Which of the following statements correctly explain the function of tell() method?
    (a) **tells the current position within the file.**  
    (b) tell the name of file.  
    (c) move the current file position to a different location.  
    (d) it changes the file position only if allowed to do so else returns an error.  

12. Which of the following statements correctly explain the function of seek() method?
    (a) tell the current position within the file.  
    (b) **indicate that the next read or write occurs from that position in a file.**  
    (c) determine if you can move the file position or not.
move the current file position to a different location at a defined offset.

13. Which of the following command is used to open a file “c:\temp.txt” in read-mode only?
   (a) `infile = open("c:\temp.txt", "r")`
   (b) `infile = open("c:\temp.txt", "r")`  **B**
   (c) `infile = open(file = "c:\temp.txt", "r")`
   (d) `infile = open(file = "c:\temp.txt", "r")`

14. Which of the following command is used to open a file “c:\temp.txt” in write-mode only?
   (a) `outfile = open("c:\temp.txt", "w")`
   (b) `outfile = open("c:\temp.txt", "w")`  **B**
   (c) `outfile = open(file = "c:\temp.txt", "w")`
   (d) `outfile = open(file = "c:\temp.txt", "w")`

15. Which of the following command is used to open a file “c:\temp.txt” in append-mode?
   (a) `outfile = open("c:\temp.txt", "a")`
   (b) `outfile = open("c:\temp.txt", "rw")`  **A**
   (c) `outfile = open("c:\temp.txt", "w")`
   (d) `outfile = open("c:\temp.txt", "r+")`

16. Which of the following commands can be used to read “n” number of characters from a file using the file object `<file>`?
   (a) `file.read(n)`  **A**
   (b) `n = file.read()`
   (c) `file.readline(n)`
   (d) `file.readlines()`

17. Which of the following commands can be used to read the entire contents of a file as a string using the file object `<tmpfile>`?
   (a) `tmpfile.read(n)`
   (b) `tmpfile.read()`  **B**
   (c) `tmpfile.readline()`
   (d) `tmpfile.readlines()`

18. Which of the following commands can be used to read the remaining lines in a file using the file object `<tmpfile>`?
   (a) `tmpfile.read(n)`
   (b) `tmpfile.read()`  **D**
   (c) `tmpfile.readline()`
   (d) `tmpfile.readlines()`

19. Which of the following statement is False regarding the opening modes of a file?
   (a) When you open a file for reading, if the file does not exist, an error occurs.  **B**
   (b) When you open a file for reading, if the file does not exist, the program will open an empty file.
   (c) When you open a file for writing, if the file does not exist, a new file is created.
(d) When you open a file for writing, if the file exists, the existing file is overwritten with the new file.

20. Which module is required to use built-in function dump()  
   (a) Math       (b) flush      (c) pickle   (d) csv

21. Which of the following function is used to write data in binary mode?  
   (a) write      (b) output     (c) dump     (d) send

22. To read 2 characters from file object f1 command should be  
   (a) f1.read(2)  (b) f1.read()   (c) f1.readline()  (d) f1.readlines()

23. To get byte position from the beginning of file, function used is -  
   (a) seek       (b) tell        (c) read      (d) write

24. The file pointer, used to go to particular position  
   (a) seek       (b) tell        (c) read      (d) write

25. In regards to separated value files such as .csv and .tsv, what is the delimiter?  
   (a) Any character such as the comma (,) or tab (\t) that is used to separate the column data.  
   (b) Delimiters are not used in separated value files  
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   (d) Any character such as the comma (,) or tab (\t) that is used to separate the row data

26. In separated value files such as .csv and .tsv, what does the first row in the file typically contain?  
   (a) The author of the table data  
   (b) The source of the data  
   (c) Notes about the table data  
   (d) The column names of the data

27. Assume you have a file object my_data which has properly opened a separated value file that uses the tab character (\t) as the delimiter. What is the proper way to open the file using the Python csv module and assign it to the variable csv_reader? Assume that csv has already been imported.  
   (a) csv.tab_reader(my_data)  
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   (c) csv.reader(my_data, delimiter='\t')  
   (d) csv.reader(my_data, tab_delimited=True)

28. When iterating over an object returned from csv.reader(), what is returned with each iteration? For example, given the following code block that assumes csv_reader is an object returned from csv.reader(), what would be printed to the console with each iteration?  
   for item in csv_reader:
       print(item)

   (a) The full line of the file as a string  
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   (c) The individual value data that is separated by the delimiter  
   (d) The column data as a list
29. Find the output of the following:
>>> Line = “Fun with Python”
>>> print (Name [ : 5 : -1])

(a) ith Python
(b) th Python
(c) nohtyP ht
(d) nohty

30. What will be the Output for the following code –
Language= ["C", "C++", "JAVA", "Python", "VB", "BASIC", "FORTRAN"]
del Language[4]
Language.remove("JAVA")
Language.pop(3)
print(Language)

(a) ['C', 'C++', 'VB', 'FORTRAN']
(b) ['C', 'C++', 'Python', 'FORTRAN']
(c) ['C', 'C++', 'BASIC', 'FORTRAN']
(d) ['C', 'C++', 'Python', 'BASIC']

31. An absolute path name begins at the _____________
(a) Leaf
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(c) current directory
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32. What happens if a local variable exists with the same name as the global variable you want to access?
(a) Error
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def fn(a):
    print(a)
x=90
fn(x)

(a) x is the formal argument.
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(c) fn(x) is the function signature.
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34. What is the output of the following –
print(21//9%3, 2**2**3)

(a) 7  64
(b) 2  256
Assertion (A) : Keys in a Python dictionary should be unique.
Reason (R) : Only immutable data types can be used as keys.

(a) A is true but R is false.
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Part-B
(Attempt any 4 out of the 5 subparts in each question)

36. In an online lottery system, names having exactly 5 characters are to be displayed. Piyush has been asked to complete this task. He has created a function FindNames() in python which read contents from a text file LOTTERY.TXT, which contains names of participants, and displays those names, which are having exactly 5 characters. He got confused with few statements and left it blank. Help him complete the code.

def FindNames():
c=0
file=open('LOTTERY.TXT', '_____') #Statement-1
line = file._____ #Statement-2
word = _____ #Statement-3
for c in word:
    if _____: #Statement-4
        print(c)
    __________ #Statement-5
FindNames()

(i) Write mode of opening the file in statement-1?
   (a) A
   (b) Ab
   (c) W
   (d) r

(ii) Fill in the blank in statement-2 to read the data from the file.
   (a) File.Read()
   (b) file.read()
   (c) read.lines()
   (d) readlines()

(iii) Fill in the blank in statement-3 to read data word by word.
   (a) Line.Split()
   (b) Line.split()
   (c) line.split()
   (d) split.word()

(iv) Fill in the blank in statement-4, which display the word having exactly 5 characters.
   (a) len(c) ==5
   (b) len(c)<5
 Fill in the blank in Statement-5 to close the file.
(a) file.close()
(b) File.Close()
(c) Close()
(d) end()

37. Snigdha is making a software on “Countries & their Capitals” in which various records are to be stored/retrieved in CAPITAL.CSV data file. It consists some records(Country & Capital). She has written the following code in python. As a programmer, you have to help her to successfully execute the program.

```python
import ___________ # Statement-1

def AddNewRec(Country,Capital): # Fn. to add a new record in CSV file
    f=open("CAPITAL.CSV",_________) # Statement-2
    fwriter=csv.writer(f)
    fwriter.writerow([Country,Capital])
    ___________ # Statement-3

def ShowRec(): # Fn. to display all records from CSV file
    with open("CAPITAL.CSV","r") as NF:
        NewReader=csv.___________(NF) # Statement-4
        for rec in NewReader:
            print(rec[0],"#",rec[1])
AddNewRec("INDIA","NEW DELHI")
AddNewRec("CHINA","BEIJING")
ShowRec() # Statement-5
```

(i) Which module should be imported in Statement-1.
   (a) pickle
   (b) csv
   (c) file
   (d) text

(ii) Which file mode to be passed to add new record in Statement-2.
    (a) w+
    (b) w
    (c) wb
    (d) a

(iii) What should be written in Statement-3 to close the file.
    (a) close()
    (b) fwriter.close()
    (c) f.close()
    (d) csv.close()

(iv) Which function to be used in Statement-4 to read the data from a csv file.
    (a) read()
    (b) readline()
    (c) readlines()
    (d) reader()
(v) The output after executing Statement-5 will be –

(a) ("INDIA", "NEW DELHI")
    ("CHINA", "BEIJING")

(b) INDIA NEW DELHI
    CHINA BEIJING

(c) INDIA, NEW DELHI
    CHINA, BEIJING

(d) INDIA # NEW DELHI
    CHINA # BEIJING

----------XXX----------
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<thead>
<tr>
<th>Part-A</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Attempt any 27 questions from question no 1 to 35.)</td>
<td></td>
</tr>
</tbody>
</table>

1. Consider the following code:
   ```python
   import math
   import random
   print(str(int(math.pow(random.randint(2, 4), 2))), end=' ')  
   print(str(int(math.pow(random.randint(3, 4), 2))), end=' ')  
   print(str(int(math.pow(random.randint(4, 4), 2))))
   ```
   What could be the possible outputs out of the given four choices?
   (a) 2 3 4
   (b) 9 16 16
   (c) 16 4 16
   (d) 2 4 9

2. What is the value of x –
   ```python
   x = 23.14 + 9//2
   ```
   a) 27.0
   b) 27.64
   c) 28
   d) 27.14

3. Which type of error will occur when the following code is executed?
   ```python
   >>> print('Cloud' + 9)
   ```
   (a) Syntax Error
   (b) Type Error
   (c) Name Error
   (d) Value Error

4. Which of the following operators can be used with strings?
   (a) /
5. Identify the valid declaration of **data**:
   (a) List  
   (b) Tuple  
   (c) String  
   (d) Dictionary

6. Which of the following functions do we use to read data in a Binary file?  
   (a) reader( )  
   (b) readlines( )  
   (c) load( )  
   (d) read( )

7. ‘+’ operator is used for ________ in strings?  
   (a) Replication  
   (b) Duplication  
   (c) Concatenation  
   (d) Updation

8. What will be the maximum and minimum value of **span**?  
   >>>span = int(23 + random.random() * 8)  
   (a) 30 and 23  
   (b) 31 and 23  
   (c) 30 and 24  
   (d) 31 and 24

9. Consider the tuple in python named NUM=(1,2,3).  
   What will be the value of **DOUBLE**, if -  
   >>> DOUBLE=NUM*2  
   (a) (2,4,6)  
   (b) (1,1,2,2,3,3)  
   (c) (1,2,3,1,2,3)  
   (d) Error

10. t=(1,2,[3,4,5],"Confused")  
    print(t[3][2])  
    Output will be –  
    (a) r4  
    (b) 5  
    (c) n  
    (d) 2

11. What is the use of seek() method in files?  
    (a) sets the file's current position at the offset  
    (b) sets the file's previous position at the offset  
    (c) sets the file's current position within the file  
    (d) none of the mentioned

12. Find the output of the following code –  
    fp = open("sample.txt", "r")  
    fp.read(8)  
    print(fp.tell())  
    fp.close()  
    (a) 0
<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
<th>Correct Answer</th>
</tr>
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<tbody>
<tr>
<td>13.</td>
<td>(a)</td>
<td>(c)</td>
</tr>
<tr>
<td>14.</td>
<td>(a)</td>
<td>(b)</td>
</tr>
<tr>
<td>15.</td>
<td>(b)</td>
<td>(c)</td>
</tr>
<tr>
<td>16.</td>
<td>(a)</td>
<td>(c)</td>
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<tr>
<td>17.</td>
<td>(a)</td>
<td>(b)</td>
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<tr>
<td>18.</td>
<td>(b)</td>
<td>(c)</td>
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<tr>
<td>19.</td>
<td>(a)</td>
<td>(b)</td>
</tr>
</tbody>
</table>

Which of the following command is used to open a file “c:\newfile.txt” in read and write mode both?  
(a) `infile = open("c:\ newfile.txt", "r")`  
(b) `infile = open("c:\ newfile.txt", "r")`  
(c) `infile = open(file = "c:\ newfile.txt", "r+")`  
(d) `infile = open(file = "c:\ newfile.txt", "r+")`

Which of the following command is used to open a file “c:\bio.txt” in write mode only?  
(a) `outfile = open("c:\bio.txt", "w")`  
(b) `outfile = open("c:\bio.txt", "w")`  
(c) `outfile = open(file = "c:\bio.txt", "w+")`  
(d) `outfile = open(file = "c:\bio.txt", "w+")`

Which of the following command is used to open a binary file “c:\record.dat” in append-mode?  
(a) `outfile = open("c:\record.dat", "a")`  
(b) `outfile = open("c:\record.dat", "ab")`  
(c) `outfile = open("c:\record.dat", "wb")`  
(d) `outfile = open("c:\record.dat", "w+")`

What will be the output of the following code if content of the file “smile.txt” is –  
Smiling is infectious,  
You catch it like the flu.  
When someone smiled at me today,  
I started smiling too.

```python
file=open("smile.txt")
contents=file.read()
print(file.read(7))
```

(a) Smiling  
(b) Smilin  
(c) ng too.  
(d) No output

The `readlines()` method returns ___________  
(a) A string  
(b) A list of words  
(c) A list of lines  
(d) A list of integers

In which of the following modes, the existing data of file will not be lost?  
(a) ab  
(b) w+  
(c) wb  
(d) wb+

If a file is opened for reading, which of the following statement(s) is(are) False?  
(a) The file must exist on the disk on the specified path.  
(b) If the file exists at the specified path, the file is successfully opened.
<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20.</td>
<td>Which of the following is not a valid mode of opening a file?</td>
<td>(a) ab</td>
<td>(b) rw</td>
<td>(c) r+</td>
<td>(d) w+</td>
<td>1</td>
</tr>
<tr>
<td>21.</td>
<td>Which of the following function is used to read data in binary mode?</td>
<td>(a) read</td>
<td>(b) reader</td>
<td>(c) load</td>
<td>(d) readlines</td>
<td>1</td>
</tr>
<tr>
<td>22.</td>
<td>Function to read all the characters of a file –</td>
<td>(a) f1.read(n)</td>
<td>(b) f1.read()</td>
<td>(c) f1.readline()</td>
<td>(d) f1.readlines()</td>
<td>1</td>
</tr>
<tr>
<td>23.</td>
<td>To move a file pointer f, 10 bytes ahead from the current position of file, function used is –</td>
<td>(a) f.seek(10)</td>
<td>(b) f.seek(10,0)</td>
<td>(c) f.seek(10,1)</td>
<td>(d) f.seek(10,2)</td>
<td>1</td>
</tr>
<tr>
<td>24.</td>
<td>If the content of the file “wish.txt” is – “Happy”, then what will be the content of the file after executing the following statements –</td>
<td>f=open(“wish.txt”, ‘w’)</td>
<td>f.write(“Birthday”)</td>
<td>f.close()</td>
<td>(a) Happy Birthday</td>
<td>(b) HappyBirthday</td>
</tr>
<tr>
<td>25.</td>
<td>Which of the following is not a function of csv module?</td>
<td>(a) readline()</td>
<td>(b) writerow()</td>
<td>(c) reader()</td>
<td>(d) writer()</td>
<td>1</td>
</tr>
<tr>
<td>26.</td>
<td>Whenever possible, what is the recommended way to ensure that a file object is properly closed after usage?</td>
<td>(a) By using try block</td>
<td>(b) Making sure that close() function is used before end of the script</td>
<td>(c) By using the with statement</td>
<td>(d) It doesn’t matter</td>
<td>1</td>
</tr>
<tr>
<td>27.</td>
<td>Which of the following is/are True?</td>
<td>(a) When you open a file for reading, if the file does not exist, an error occurs.</td>
<td>(b) When you open a file for writing, if the file does not exist, a new file is created.</td>
<td>(c) When you open a file for writing, if the file exists, the existing file is overwritten with the new file.</td>
<td>(d) All of the above</td>
<td>1</td>
</tr>
<tr>
<td>28.</td>
<td>Given the file image.png, which of the following is the correct way to open the file for reading as a buffered binary file?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
29. What is the output of the following?
d = {“one”: ‘I’, “two”: ‘II’, “three”: ’III’}
for i in d:
    print(i)
(a) one
    two
    three
(b) I
    II
    III
(c) one I
two II
three III
(d) 0
    1
    2

30. What is the output when following code is executed?
>>> print (r"Python\tProgram")
(a) Python     Program
(b) r Python     Program
(c) Error
(d) Python\tProgram

31. Which of the following is the use of id() function in python?
   (a) id returns the identity of the object
   (b) Every object doesn’t have a unique id
   (c) All of the mentioned
   (d) None of the mentioned

32. What is the output of the program given below?
num = 45
def func (num):
    num = 23
func (num)
print (‘num is now’, num)
(a) num is now 45
(b) num is now 23
(c) num is now 68
(d) Error

33. Consider the expression given below. The value of X is:
   X = 2+9*((3*12)-8)/10
   (a) 30.0
34. Find the output of the following –
>>> list1=[1,2,3]
>>> list2=[1,2,2,3]
>>> list1>list2

(a) Error
(b) False
(c) True
(d) None

35. **Assertion (A):** Parameters with default arguments can be followed by parameters with no default argument.

**Reason (R):** Syntactically, it would be impossible for the interpreter to decide which values match which arguments if mixed modes were allowed while providing default arguments.

(a) A is true but R is false.
(b) A is false but R is true.
(c) Both A and R are false.
(d) Both A and R are true but R is not the correct explanation of A.
(e) Both A and R are true and R is the correct explanation of A.

---

**Part-B**

(Attempt any 4 out of the 5 subparts in question no. 36 and 37)

36. Shubham Dixit of class 12 is writing a program to create a CSV file “hobby.csv” which will contain Name and hobby name for some entries. He has written the following code. As a programmer, help him to successfully execute the given task.

```python
import __________ # Line 1

def addCsvFile(Name,Hobby): # to write / add data into the CSV file
    f=open('hobby.csv','____') # Line 2
    newFileWriter = csv.writer(f)
    newFileWriter.writerow([Name,Hobby])
    f.close()

def readCsvFile(): # to read data from CSV file
    newFile = open('hobby.csv','r')
    newRowReader = csv.___________(newFile) # Line 3
    for row in newRowReader:
        print (row[0],"@",row[1])
    newFile.___________ # Line 4

addCsvFile("Pranav","Cricket")
addCsvFile("Sunaina","Badminton")
addCsvFile("Manish","Painting")
readCsvFile() #Line 5
```
(i) Name the module he should import in Line 1.
   (a) pickle
   (b) csv
   (c) file
   (d) random

(ii) In which mode, Shubham should open the file to add data into the file. (Line 2)
   (a) w+
   (b) r
   (c) r+
   (d) a

(iii) Fill in the blank in Line 3 to read the data from a csv file.
   (a) load()
   (b) read()
   (c) reader()
   (d) readline()

(iv) Fill in the blank in Line 4 to close the file.
   (a) close()
   (b) Close()
   (c) CLOSE()
   (d) end()

(v) Write the output he will obtain while executing Line 5.
   (a) Pranav Cricket
       Sunaina Badminton
       Manish Painting
   (b) “Pranav” “Cricket”
       “Sunaina” “Badminton”
       “Manish” “Painting”
   (c) Pranav @ Cricket
       Sunaina @ Badminton
       Manish @ Painting
   (d) “Pranav” @ “Cricket”
       “Sunaina” @ “Badminton”
       “Manish” @ “Painting”

37. Subrat Ray is learning to work with Binary files in Python using a process
known as Pickling/de-pickling. His teacher has given him the following
incomplete code, which is creating a Binary file namely Mydata.dat and then
opens, reads and displays the content of this created file.

```python
import ___________  #Statement-1
sqlist=list()
for k in range(5):
    sqlist.append(k*k)
fout=open("mydata.dat", ____ ) #Statement-2
___________(sqlist,fout) #Statement-3
fout.close()
fin=open("Mydata.dat", "rb")
mylist=___________(fin) #Statement-4
fin.close()
print(mylist) #Statement-5
```
<table>
<thead>
<tr>
<th></th>
<th>Which module should be imported in Statement-1.</th>
</tr>
</thead>
</table>
| (i) | (a) pickle  
(b) csv  
(c) file  
(d) text | 1 |

<table>
<thead>
<tr>
<th></th>
<th>Which file mode to be passed to write data in file in Statement-2.</th>
</tr>
</thead>
</table>
| (ii) | (a) w+  
(b) w  
(c) wb  
(d) a | 1 |

<table>
<thead>
<tr>
<th></th>
<th>What should be written in Statement-3 to write data onto the file.</th>
</tr>
</thead>
</table>
| (iii) | (a) dump()  
(b) write()  
(c) pickle.dump()  
(d) writeln() | 1 |

<table>
<thead>
<tr>
<th></th>
<th>Which function to be used in Statement-4 to read the data from the file.</th>
</tr>
</thead>
</table>
| (iv) | (a) load()  
(b) readline()  
(c) readlines()  
(d) pickle.load() | 1 |

<table>
<thead>
<tr>
<th></th>
<th>The output after executing Statement-5 will be –</th>
</tr>
</thead>
</table>
| (v) | (a) 0 1 4 9 16  
(b) 1, 4, 9, 16, 25  
(c) [0, 1, 4, 9, 16]  
(d) [1, 4, 9, 16, 25] | 1 |

----------All the Best----------
**General Instructions to the Examinee:**

1. This question paper contains two parts A and B. Each part is compulsory.
2. Both Part A and Part B have choices.
3. Part-A is having MCQs (Attempt 27 out of 35 questions).
4. Part- B has two questions based on Case studies.
   a. Each case study has 4 case-based subparts.
   b. An examinee is to attempt any 4 out of the 5 subparts.
5. All programming questions are to be answered using Python Language only.

### Part-A

(Attempt any 27 questions from question no 1 to 35.)

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Consider the following code: import math import random print(str(int(math.pow(random.randint(2,4),2))),end=' ') print(str(int(math.pow(random.randint(3,4),2))),end=' ') print(str(int(math.pow(random.randint(4,4),2))))</td>
<td>(a) 2 3 4 (b) 9 16 16 (c) 16 4 16 (d) 2 4 9</td>
</tr>
<tr>
<td>2.</td>
<td>What is the value of x – x = 23.14 + 9//2</td>
<td>a) 27.0 b) 27.64 c) 28 d) 27.14</td>
</tr>
<tr>
<td>3.</td>
<td>Which type of error will occur when the following code is executed? &gt;&gt;&gt;print('Cloud' + 9)</td>
<td>(a) Syntax Error</td>
</tr>
</tbody>
</table>
4. Which of the following operators can be used with strings?
   (a) /  
   (b) *  
   (c) %  
   (d) –

5. Identify the valid declaration of **data**:
   (a) List  
   (b) **Tuple**  
   (c) String  
   (d) Dictionary

6. Which of the following functions do we use to read data in a Binary file?
   (a) reader( )  
   (b) readlines( )  
   (c) load( )  
   (d) read( )

7. ‘+’ operator is used for ______ in strings?
   (a) Replication  
   (b) Duplication  
   (c) **Concatenation**  
   (d) Updation

8. What will be the maximum and minimum value of **span**?
   >>> span = int(23 + random.random() * 8)
   (a) 30 and 23  
   (b) 31 and 23  
   (c) 30 and 24  
   (d) 31 and 24

9. Consider the tuple in python named **NUM**=(1,2,3).
   What will be the value of **DOUBLE**, if -
   >>> DOUBLE=NUM*2
   (a) (2,4,6)  
   (b) (1,1,2,2,3,3)  
   (c) (1,2,3,1,2,3)  
   (d) Error

10. t=(1,2,[3,4,5],"Confused")
    print(t[3][2])
    Output will be –
    (a) 4  
    (b) 5  
    (c) n  
    (d) 2

11. What is the use of seek() method in files?
    (a) sets the file’s current position at the offset  
    (b) sets the file’s previous position at the offset  
    (c) sets the file’s current position within the file  
    (d) none of the mentioned
12. Find the output of the following code –
   fp = open("sample.txt", "r")
   fp.read(8)
   print(fp.tell())
   fp.close()
   (a) 0  
   (b) 7  
   (c) 8  
   (d) 9  
   C

13. Which of the following command is used to open a file “c:\newfile.txt” in read and write mode both?
   (a) infile = open("c:\ newfile.txt", “r”)  
   (b) infile = open("c:\ newfile.txt", “r”)  
   (c) infile = open(file = “c:\ newfile.txt”, “r+”)  
   (d) infile = open(file = “c:\ newfile.txt”, “r+”)
   D

14. Which of the following command is used to open a file “c:\bio.txt” in write mode only?
   (a) outfile = open("c:\bio.txt", “w”)  
   (b) outfile = open("c:\bio.txt", “w”)  
   (c) outfile = open(file = “c:\bio.txt”, “w+”)  
   (d) outfile = open(file = “c:\bio.txt”, “w+”)
   B

15. Which of the following command is used to open a binary file “c:\record.dat” in append-mode?
   (a) outfile = open("c:\record.dat", “a”)  
   (b) outfile = open("c:\record.dat", “ab”)  
   (c) outfile = open("c:\record.dat", “wb”)  
   (d) outfile = open("c:\record.dat", “w+”)
   A

16. What will be the output of the following code if content of the file “smile.txt” is –
   Smiling is infectious,
   You catch it like the flu.
   When someone smiled at me today,
   I started smiling too.

   file=open("smile.txt")
   contents=file.read()
   print(file.read(7))
   (a) Smiling
   (b) Smilin
   (c) ng too.
   (d) No output
   D

17. The readlines() method returns ___________
   (a) A string
   (b) A list of words
   (c) A list of lines
   (d) A list of integers
   C

18. In which of the following modes, the existing data of file will not be lost?
   (a) ab
   (b) w+
   A
<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.</td>
<td>If a file is opened for reading, which of the following statement(s) is(are) False?</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>(a) The file must exist on the disk on the specified path.</td>
<td></td>
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<td></td>
<td>(b) If the file exists at the specified path, the file is successfully opened.</td>
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<td></td>
<td>(c) <strong>The file, even if at a different location on disk other than the specified path, will get opened.</strong></td>
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<td></td>
<td>(d) Python gives error if the file does not exist at the specified path.</td>
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<tr>
<td>20.</td>
<td>Which of the following is not a valid mode of opening a file?</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>(a) ab</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) rw</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(c) r+</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(d) w+</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Which of the following function is used to read data in binary mode?</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>(a) read</td>
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</tr>
<tr>
<td></td>
<td>(b) reader</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(c) load</td>
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<td></td>
<td>(d) readlines</td>
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<tr>
<td></td>
<td>(c) f.seek(10,1)</td>
<td></td>
</tr>
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<td></td>
<td>(d) f.seek(10,2)</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>If the content of the file “wish.txt” is – “Happy”, then what will be the content of the file after executing the following statements – f=open(“wish.txt”, ‘w’) f.write(“Birthday”) f.close()</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>(a) Happy Birthday</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) HappyBirthday</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(c) Happy</td>
<td></td>
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<tr>
<td></td>
<td>(d) Birthday</td>
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<td>25.</td>
<td>Which of the following is not a function of csv module?</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>(a) readline()</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) writerow()</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(c) reader()</td>
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<td></td>
<td>(c) <strong>By using the with statement</strong></td>
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<td>(d) It doesn’t matter</td>
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<td>27.</td>
<td>Which of the following is/are True?</td>
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<td>(a) When you open a file for reading, if the file does not exist, an error occurs.</td>
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<td></td>
<td>(c) When you open a file for writing, if the file exists, the existing file is overwritten with the new file.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(d) <strong>All of the above</strong></td>
<td></td>
</tr>
</tbody>
</table>
28. Given the file image.png, which of the following is the correct way to open the file for reading as a buffered binary file?
   (a) open("image.png")
   (b) open("image.png", "r")
   (c) open("image.png", "rb")
   (d) open("image.png", "wb")
   C

29. What is the output of the following?
   d = {“one”: 'I', “two”: 'II', “three”: 'III'}
   for i in d:
     print(i)
   (a) one
two
three
(b) I
II
III
(c) one I
two II
three III
(d) 0
1
2
A

30. What is the output when following code is executed?
   >>>print(r"Python\tProgram")
   (a) Python   Program
   (b) r Python   Program
   (c) Error
   (d) Python\tProgram
   D

31. Which of the following is the use of id() function in python?
   (a) id returns the identity of the object
   (b) Every object doesn’t have a unique id
   (c) All of the mentioned
   (d) None of the mentioned
   A

32. What is the output of the program given below?
   num = 45
   def func (num):
     num = 23
   func (num)
   print (‘num is now’, num)
   (a) num is now 45
   (b) num is now 23
   (c) num is now 68
   (d) Error
   A
33. Consider the expression given below. The value of X is:
   \[ X = 2 + 9 \times ((3 \times 12) - 8) / 10 \]
   (a) 30.0
   (b) **27.2**
   (c) 28.4
   (d) 30.8

34. Find the output of the following –
   >>> list1=[1,2,3]
   >>> list2=[1,2,2,3]
   >>> list1>list2
   (a) Error
   (b) False
   (c) **True**
   (d) None

35. **Assertion (A):** Parameters with default arguments can be followed by parameters with no default argument.
   **Reason (R):** Syntactically, it would be impossible for the interpreter to decide which values match which arguments if mixed modes were allowed while providing default arguments.
   (a) A is true but R is false.
   (b) **A is false but R is true.**
   (c) Both A and R are false.
   (d) Both A and R are true but R is not the correct explanation of A.
   (e) Both A and R are true and R is the correct explanation of A.

**Part-B**

(Attempt any 4 out of the 5 subparts in question no. 36 and 37)

36. Shubham Dixit of class 12 is writing a program to create a CSV file “hobby.csv” which will contain Name and hobby name for some entries. He has written the following code. As a programmer, help him to successfully execute the given task.

```python
import ____ # Line 1

def addCsvFile(Name,Hobby): # to write / add data into the CSV file
    f=open('hobby.csv','____') # Line 2
    newFileWriter = csv.writer(f)
    newFileWriter.writerow([Name,Hobby])
    f.close()
#csv file reading code

def readCsvFile(): # to read data from CSV file
    newFile = open('hobby.csv','r')
    newFileReader = csv.______(newFile) # Line 3
    for row in newFileReader:
        print (row[0],"@",row[1])
    newFile.______ # Line 4
addCsvFile("Pranav","Cricket")
addCsvFile("Sunaina","Badminton")
addCsvFile("Manish","Painting")
```
<p>| | |</p>
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</table>
| (i) | Name the module he should import in Line 1.  
(a) pickle  
(b) csv  
(c) file  
(d) random |
| B |   |
| (ii) | In which mode, Shubham should open the file to add data into the file.(Line 2)  
(a) w+  
(b) r  
(c) r+  
(d) a |
| D |   |
| (iii) | Fill in the blank in Line 3 to read the data from a csv file.  
(a) load()  
(b) read()  
(c) reader()  
(d) readline() |
| C |   |
| (iv) | Fill in the blank in Line 4 to close the file.  
(a) close()  
(b) Close()  
(c) CLOSE()  
(d) end() |
| A |   |
| (v) | Write the output he will obtain while executing Line 5.  
(a) Pranav Cricket  
   Sunaina Badminton  
   Manish Painting  
(b) “Pranav” “Cricket”  
   “Sunaina” “Badminton”  
   “Manish” “Painting”  
(c) Pranav @ Cricket  
   Sunaina @ Badminton  
   Manish @ Painting  
(d) “Pranav” @ “Cricket”  
   “Sunaina” @ “Badminton”  
   “Manish” @ “Painting” |
| C |   |

37. Subrat Ray is learning to work with Binary files in Python using a process known as Pickling/de-pickling. His teacher has given him the following incomplete code, which is creating a Binary file namely Mydata.dat and then opens, reads and displays the content of this created file.

```python
import ___________ #Statement-1
sqlist=list()  
for k in range(5):  
    sqlist.append(k*k)  
fout=open(“mydata.dat”, _____) #Statement-2
```
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</tbody>
</table>

(i) Which module should be imported in Statement-1.
   (a) pickle  
   (b) csv  
   (c) file  
   (d) text

(ii) Which file mode to be passed to write data in file in Statement-2.
   (a) w+  
   (b) w  
   (c) wb  
   (d) a

(iii) What should be written in Statement-3 to write data onto the file.
   (a) dump()  
   (b) write()  
   (c) pickle.dump()  
   (d) writeln()

(iv) Which function to be used in Statement-4 to read the data from the file.
   (a) load()  
   (b) readline()  
   (c) readlines()  
   (d) pickle.load()

(v) The output after executing Statement-5 will be –
   (a) 0 1 4 9 16  
   (b) 1, 4, 9, 16, 25  
   (c) [0, 1, 4, 9, 16]  
   (d) [1, 4, 9, 16, 25]
**COMPUTER NETWORKS**

**E V O L U T I O N  O F  N E T W O R K I N G**

**INTERNET**
- The Internet is a global network of billions of computers and other electronic devices.

**INTERSPACE**
- Interspace is a software that allows multiple users in a client-server environment to communicate with each other to send and receive data of various types such as data, files, video, audio and textual data.

**EVOLUTION OF NETWORKING**

**SWITCHING TECHNIQUES**

**CIRCUIT SWITCHING**

**PACKET SWITCHING**

---

**Differences Between Circuit & Packet Switching**

<table>
<thead>
<tr>
<th>Circuit-switching</th>
<th>Packet-Switching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guaranteed capacity</td>
<td>No guarantees (best effort)</td>
</tr>
<tr>
<td>Capacity is wasted if data is bursty</td>
<td>More efficient</td>
</tr>
<tr>
<td>Before sending data establishes a path</td>
<td>Send data immediately</td>
</tr>
<tr>
<td>All data in a single flow follow one path</td>
<td>Different packets might follow different paths</td>
</tr>
<tr>
<td>No reordering, constant delay; no pkt drops</td>
<td>Packets may be reordered, delayed, or dropped</td>
</tr>
</tbody>
</table>

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DATA COMMUNICATION TERMINOLOGIES

A CHANNEL is a communication medium, the path that data takes from source to destination.

BANDWIDTH is the maximum amount of data transmitted over an internet connection in a given amount of time.

Hz – Hertz

KHz – Kilo Hertz

MHz – Mega Hertz

DATA TRANSFER RATE is commonly used to measure how fast data is transferred from one location to another.

bps – bits per sec

Kbps – Kilobit per sec

Mbps – Megabit per sec

Gbps – Gigabit per sec

TRANSMISSION MEDIA

Transmission Media

Guided

Twisted Pair Cable

Co-axial Cable

Optical Fiber

Unguided

Infrared

Radio waves

Microwaves

Satellite
NETWORK DEVICES

**MODEM** – (modulator-demodulator), a device that makes it possible for computers to communicate with one another without being directly connected to each other.

**RJ45 Connector** – A registered jack (RJ) is a standardized physical network interface for connecting telecommunications or data equipment.

**ETHernet CARD** – An Ethernet card is the communications hub for your computer; it connects to a network using a network cable.

**SWITCH** – A switch is a device in a computer network that connects other devices together.

**GATEWAY** – A gateway is a network node that forms a passage between two networks operating with different transmission protocols.

**ROUTER** – The router is a physical or virtual internetworking device that is designed to receive, analyze, and forward data packets between computer networks.

**WiFi CARD** – It receives the wireless signal and communicates with the wireless network, enabling you to access the Web with your laptop.
**Network Topologies**

**Bus** – A bus topology is a topology for a Local Area Network (LAN) in which all the nodes are connected to a single cable.

**Star** – A star topology is a topology for a Local Area Network (LAN) in which all nodes are individually connected to a central connection point, like a hub or a switch.

**Tree** – A tree topology is a special type of structure where many connected elements are arranged like the branches of a tree.

**LAN** – Local Area Network

**MAN** – Metropolitan Area Network

**PAN** – Personal Area Network

**WAN** – Wide Area Network
**COMPARISON BETWEEN 1G, 2G, 3G, 4G AND 5G**

<table>
<thead>
<tr>
<th>Technology / Features</th>
<th>1G</th>
<th>2/2.5G</th>
<th>3G</th>
<th>4G</th>
<th>5G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Bandwidth</td>
<td>2 kbps</td>
<td>14.4-64 kbps</td>
<td>2 Mbps</td>
<td>200 Mbps to 1 Gbps for low mobility</td>
<td>1 Gbps and higher</td>
</tr>
<tr>
<td>Technology</td>
<td>Analog cellular technology</td>
<td>Digital cellular technology</td>
<td>Broadbandwidth, CDMA, IP technology</td>
<td>Unified IP and seamless combination of broadband, LAN/WAN</td>
<td>Unified IP and seamless combination of broadband,</td>
</tr>
</tbody>
</table>

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**VoIP – Voice Over Internet Protocol**

It is a technology that allows you to make voice calls using a broadband internet connection instead of a regular phone line.

---

**WiFi – Wireless Fidelity**

WiFi is a universal wireless networking technology that utilizes radio frequencies to transfer data.

---

**WiMax –**

WiMax stands for Worldwide Interoperability for Microwave Access (WiMax), and it is a technology for point to multipoint wireless networking. It provides high-speed data over a wide area.
**INTRODUCTION TO WEB SERVICES**

**WWW:** It is a worldwide network of devices like computers, laptops, tablets, etc. It enables users to send emails to other users and chat with.

**Hypertext Markup Language (HTML):** is the standard markup language for documents designed to be displayed in a web browser.

**Extensible Markup Language (XML):** is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable.

**A Uniform Resource Locator (URL):** colloquially termed a web address is a reference to a web resource that specifies its location on a computer network and a mechanism for retrieving it.

**A Domain name:** is an identification string that defines a realm of administrative autonomy, authority or control within the Internet. Domain names are formed by the rules and procedures of the Domain Name System (DNS).

**A web server:** is software and hardware that uses HTTP and other protocols to respond to client requests made over the World Wide Web. The main job of a web server is to display website content through storing, processing and delivering webpages to users.

**A website:** is a collection of web pages and related content that is identified by a common domain name and published on at least one web server.

**A web hosting service:** is a type of Internet hosting service that allows individuals and organizations to make their website accessible via the World Wide Web.

**A web browser:** (commonly referred to as a browser) is a software application for accessing information on the World Wide Web.
Multiple Choice Questions (MCQs)

Choose the correct answer from the given below:

1. A Computer Network:
   A. Is a collection of hardware components and computers?
   B. Is interconnected by communication channels
   C. Allows sharing of resources and information
   D. All of the above

2. What is a Firewall in computer network?
   A. The physical boundary of network
   B. An operating system of computer network
   C. A system designed to prevent unauthorized access
   D. A web browsing software

3. What is the use of Bridge in the Network?
   A. To connect LANs
   B. To separate LANs
   C. To control network speed
   D. All of the above

4. Each IP packet must contain:
   A. Only Source address
   B. Only Destination address
   C. Source and Destination address
   D. Source or Destination address

5. Which of these is not a communication channel?
   A. Satellite
   B. Microwave
   C. Radio wave
   D. Wi-Fi

6. MAN Stands for _____.
   A. Metropolitan Area Network
   B. Main Area Network
   C. Metropolitan Access Network
   D. Metro Access Network

7. Which of the following is the smallest network?
   A. WAN
   B. MAN
   C. PAN
   D. LAN

8. Which transmission media is capable of having a much higher bandwidth (data capacity)?
   A. Coaxial
   B. Twisted pair cable
   C. Untwisted cable
   D. Fiber optic

9. Which type of transmission media is the least expensive to manufacture?
   A. Coaxial
   B. Twisted pair cable
   C. CAT cable
   D. Fiber optic
10. A device that forwards data packet from one network to another is called a
A. Bridge
B. Router
C. Hub
D. Gateway

11. What is a standalone computer?
A. A computer that is not connected to a network
B. A computer that is being used as a server
C. A computer that does not have any peripherals attached to it
D. A computer that is used by only one person

12. Which of the following is the fastest media of data transfer?
A. Co-axial Cable
B. Untwisted Wire
C. Telephone Lines
D. Fiber Optic

13. Hub is a
A. Broadcast device
B. Unicast device
C. Multicast device
D. None of the above

14. Switch is a
A. Broadcast device
B. Unicast device
C. Multicast device
D. None of the above

15. The device that can operate in place of a hub is a:
A. Switch
B. Bridge
C. Router
D. Gateway

16. In computer, converting a digital signal in to an analog signal is called
A. modulation
B. demodulation
C. conversion
D. transformation

17. What is the address size of IPv6?
A. 32 bit
B. 64 bit
C. 128 bit
D. 256 bit

18. Which of these is not an example of unguided media?
A. Optical Fibre Cable
B. Radio wave
C. Bluetooth
D. Satellite
19. Two devices are in network if
A. A process in one device is able to exchange information with a process in another device
B. A process is running on both devices
C. The processes running of different devices are of same type
D. None of the above.

20. Which of the following is not the Networking Devices?
A. Gateways
B. Linux
C. Routers
D. Firewalls

21. The location of a resource on the internet is given by its?
A. Protocol
B. URL
C. E-mail address
D. ICQ

22. The term HTTP stands for?
A. Hyper terminal tracing program
B. Hypertext tracing protocol
C. Hypertext transfer protocol
D. Hypertext transfer program

23. Which software prevents the external access to a system?
A. Firewall
B. Gateway
C. Router
D. Virus checker

24. Which one of the following is the most common internet protocol?
A. HTML
B. NetBEUI
C. TCP/IP
D. IPX/SPX

25. The term FTP stands for?
A. File transfer program
B. File transmission protocol
C. File transfer protocol
D. File transfer protection

26. Which one of the following is not a network topology?
A. Star
B. Ring
C. Bus
D. Peer to Peer
27. Which of the following is not an unit for data transfer rate?
   A. MBPS  
   B. KBPS  
   C. SBPS  
   D. GBPS

28. This was the first network.
   A. CSNET  
   B. NSFNET  
   C. ANSNET  
   D. ARPANET

29. A_______is a data communication system within a building, plant, or campus, or between nearby buildings.
   A. MAN  
   B. LAN  
   C. WAN  
   D. None of the above

30. ___________ is a collection of many separate networks
   A. A MAN  
   B. An internet  
   C. A LAN  
   D. None of the above

31. A_______is a set of rules that governs data communication.
   A. forum  
   B. protocol  
   C. standard  
   D. None of the above

32. Which of the following is required to communication between two computers?
   A. Communication hardware  
   B. Communications software  
   C. Protocol  
   D. All of above including access to transmission medium

33. Bluetooth is an example of
   A. Wide area network  
   B. Virtual private network  
   C. Local area network  
   D. Personal area network

34. A device which can be connected to a network without using cable is called
   A. Distributed device  
   B. Centralized device  
   C. Open-source device  
   D. Wireless device

35. The vast network of computers that connects millions of people all over the world is called
   A. Internet  
   B. Hypertext  
   C. LAN
36. MAC address is of ___________
   A. 24 bits  
   B. 36 bits  
   C. 42 bits  
   D. 48 bits

37. Which of the following appears harmless but actually performs malicious functions such as deleting or damaging files.
   A. WORM  
   B. Virus  
   C. Trojan Horse  
   D. Malware

38. Name the protocol that is used to send emails
   A. FTP  
   B. SMTP  
   C. HTTP  
   D. TCP

39. Name the protocol that is used to receive emails
   A. POP  
   B. VOIP  
   C. DHCP  
   D. FTP

40. Rajesh has purchased a new Smart TV and wants to cast a video from his mobile to his new Smart TV. Identify the type of network he is using:
   A. LAN  
   B. MAN  
   C. WAN  
   D. PAN

41. The topology in which all nodes are individually connected to a central connection point:
   A. Ring  
   B. Bus  
   C. Star  
   D. Tree

42. Which of the following best describes uploading information?
   A. Sorting data on a disk drive  
   B. Sending information to a host computer  
   C. Receiving information from a host computer  
   D. Sorting data on a hard drive

43. The term IPv4 stands for?
   A. Internet Protocol Version 4  
   B. Internet Programming Version 4  
   C. International Programming Version 4  
   D. None of these
4. In specific, if the systems use separate protocols, which one of the following devices is used to link two systems?
   A. Repeater
   B. Gateway
   C. Bridge
   D. Hub

45. DNS is the abbreviation of
   A. Dynamic Name System
   B. Dynamic Network System
   C. Domain Name System
   D. Domain Network Service

46. What is the meaning of Bandwidth in Network?
   A. Transmission capacity of a communication channels
   B. Connected Computers in the Network
   C. Class of IP used in Network
   D. None of Above

47. What does protocol defines?
   A. Protocol defines what data is communicated.
   B. Protocol defines how data is communicated.
   C. Protocol defines when data is communicated.
   D. All of above

48. Which of the following can be Software?
   A. Routers
   B. Firewalls
   C. Gateway
   D. Modems

49. The loss in signal power as light travels down the fiber is called............
   A. Attenuation
   B. Propagation
   C. Scattering
   D. Interruption

50. Which of the following TCP/IP protocols is used for transferring files from one machine to another.
   A. FTP
   B. SNMP
   C. SMTP
   D. RPC

51. Which of the following protocol is used for remote terminal connection service?
   A. RARP
   B. UDP
   C. FTP
   D. TELNET
52. Which of the following is considered as the unsolicited commercial email?
A. Virus  
B. Malware  
C. Spam  
D. All of the above

53. It can be a software program or a hardware device that filters all data packets coming through the internet, a network, etc. it is known as the_______:
A. Antivirus  
B. Firewall  
C. Cookies  
D. Malware

54. The term "TCP/IP" stands for______
A. Transmission Contribution protocol/ internet protocol  
B. Transmission Control Protocol/ internet protocol  
C. Transaction Control protocol/ internet protocol  
D. Transmission Control Protocol/ internet protocol

55. Which of the following is a type of independent malicious program that never required any host program?
A. Trojan Horse  
B. Worm  
C. Trap Door  
D. Virus

56. In order to ensure the security of the data/ information, we need to ____________ the data:
A. Encrypt  
B. Decrypt  
C. Delete  
D. None of the above

57. Firewall is the type of ………
A. Virus  
B. Security threats  
C. Worm  
D. None of the above.

58. It allow a visited website to store its own information about a user on the user’s computer:
A. Spam  
B. cookies  
C. Malware  
D. Adware

59. In which of the following switching methods, the message is divided into small packets?
A. Message switching  
B. Packet switching  
C. Circuit switching  
D. None of these
60. Which of the following switch methods creates a point-to-point physical connection between two or more computers?
A. Message switching  
B. Packet switching  
C. Circuit switching  
D. None of these  

61. MAC address is also called ______.
A. Physical address  
B. Logical address  
C. Source address  
D. Destination address  

62. ARPANET stands for ______.
A. Advanced Recheck Projects Agency Internet  
B. Advanced Recheck Projects Agency Network  
C. Advanced Research Projects Agency Network  
D. Advanced Research Projects Agency Internet  

63. Which of the following devices is not a networking device?
A. Hub  
B. Switch  
C. Bridge  
D. None of these  

64. How many pins does RJ-45 contain?
A. Two  
B. Four  
C. Eight  
D. Ten  

65. NIC Stands for –  
A. Network identity card  
B. Network interface code.  
C. National interface card  
D. Network interface card  

66. Which of the following is not a type of guided or wired communication channel?
A. Twisted Pair  
B. Coaxial  
C. Fibre Optic  
D. WiMax  

67. Which of the following is not a type of unguided or wireless communications channel?
A. Microwave  
B. Radiowave  
C. Ethernet  
D. Satellite  

68. Which of the following wireless medium consists of a parabolic antenna mounted on towers?
A. Satellite  
B. Radiowave  
C. Microwave  
D. Infrared
69. Which of the following cable consist of a solid wire core surrounded by one or more foil or wire shields?
A. Ethernet Cables  
B. Coaxial Cables  
C. Fibre Optic Cables  
D. Power Cable

70. A collection of hyperlinked documents on the internet forms the?
A. World Wide Web (WWW)  
B. E-mail system  
C. Mailing list  
D. Hypertext

71. Protocols are set of rules to govern__________  
A. Communication  
B. Standard  
C. Metropolitan communication  
D. Bandwidth

72. An internet is a__________  
A. Collection of WANS  
B. Network of networks  
C. Collection of LANS  
D. Collection of identical LANS and WANS

73. Which protocol is commonly used to retrieve email from a mail server?
A. FTP  
B. IMAP  
C. HTML  
D. TELNET

74. Which of the following allows user to view a webpage?
A. Operating System  
B. Website  
C. Interpreter  
D. Internet Browser

75. A network router joins two ________ together?
A. Computers  
B. Switches  
C. Networks  
D. Gateway

76. A network point that provides entrance into another network is called as__________  
A. Node  
B. Gateway  
C. Switch  
D. Router
77. TELNET used _________ protocol for data connection
A. TCP
B. UDP
C. IP
D. DHCP

78. Google Chrome is example of :
A. Programming Language
B. Web Server
C. Protocol
D. Web Browser

79. Name the transmission media best suitable for connecting to hilly areas.
A. Co-axial Cable
B. Twisted pair
C. Microwave
D. Optical fiber.

80. Rahul wants to establish computer network in his cyber café, which of the following device will be suggested by you to connect each computer in the cafe?
A. Switch
B. Modem
C. Gateway
D. Repeater

Very Short Answer Type Questions (1 mark)

Q1. Give one example of each – Guided media and unguided media.
**Ans:** Guided – Twisted pair, Coaxial Cable, Optical Fiber (any one) Unguided – Radio waves, Satellite, Micro Waves (any one)

Q2. Name the protocol that is used to transfer file from one computer to another.
**Ans:** FTP

Q3. Name the transmission media best suitable for connecting to desert areas.
**Ans:** Microwave

Q4. Rearrange the following terms in increasing order of speedy medium of data transfer:
Telephone line, Fiber Optics, Coaxial Cable, Twisted Paired Cable.
**Ans:** Telephone line, Twisted Pair Cable, Coaxial Cable, Fiber Optics.

Q5. Which of the following appears harmless but actually performs malicious functions such as deleting or damaging files.
(a) WORM (b) Virus (c) Trojan Horse (d) Malware
**Ans:** (c) Trojan Horse

Q6. Name the transmission media suitable to establish PAN.
**Ans:** Bluetooth, infra-red

Q7. Name the protocol that is used to upload and download files on internet.
Ans: FTP or HTTP

Q8. Name the protocol that is used to send emails.
Ans: SMTP

Q9. Name the protocol that is used to receive emails.
Ans: POP

Q10. Name the transmission media best suitable for connecting to hilly areas.
Ans: Microwave / Radio wave.

Q11. Name the fastest available transmission media.
Ans: OFC (Optical Fiber Cable)

Q12. Sunil has purchased a new Smart TV and wants to cast a video from his mobile to his new Smart TV. Identify the type of network he is using and explain it.
Ans: Sunil is using PAN-Personal Area Network. It is a private network which is setup by an individual to transfer data among his personal devices of home.

Short Answer Type Questions (2 mark)

Q1. Expand the following terms:
IPR – Intellectual Property Rights SIM – Subscriber’s Identity Module
IMAP – Internet Message Access Protocol HTTP – Hypertext transfer Protocol
GPRS – General Packet Radio Service IRC – Internet Relay Chat
CDMA- Code Division Multiple Access TDMA- Time Division Multiple Access VPN- Virtual Private Network
FLOSS- Free Libre Open Source Software XML-Extensible Markup Language SMS–Short Messaging Service
GSM-Global system for mobile communication PHP- Hypertext Preprocessor
FTP- File Transfer Protocol
DHCP-Dynamic Host Configuration Protocol

Q2. What is difference between star topology and bus topology of network?
Answer:
In star topology, nodes are connected to server individually whereas in bus topology all nodes are connected to server along a single length of cable.
Q3. Write two advantages of using an optical fibre cable over an ethernet cable to connect two service stations, which are 190 m away from each other.

**Answer:**
- **Low power** Because signals in optical fibres degrade less, lower power transmitters can be used.
- **Higher datarate** Due to higher bandwidth, data rate of optical fibre is more than the data rate of ethernet cable (upto 1 Gbps).

Q4. Differentiate between packet switching and message switching technique in network communication.

**Answer:**
- **Message Switching** In message switching data is stored in buffer form. The message is sent to the nearest directly connected switching node. This process continues until data is delivered to the destination computer.
- **Packet Switching** In this form of switching data is transferring into packet form. A fixed size of packet that can be transmitted across the network is specified. All the packets are stored in the main memory instead of disk.

Q5. Which type of network (out of LAN, PAN and MAN) is formed, when you connect two mobiles using bluetooth to transfer a picture file?

**Answer:**
When two mobiles are connected using bluetooth to transfer a picture file, a PAN(Personal Area Network) is created.

Q6. What is the difference between HTTP and FTP?

**Answer:**
- FTP is a protocol used to upload files from a workstation to a FTP server or download files from a FTP server to a workstation.
- HTTP is a protocol used to transfer files from a web server onto a browser in order to view a web page that is on the Internet.

Q7. What is the advantage of using SWITCH over HUB?

**Answer:**
Switch provides a dedicated line at full bandwidth between two devices but hub doesn’t provide a dedicated line. Hub share the bandwidth.

Q8. What is difference between star topology and bus topology of network?

**Answer:**
In star topology, nodes are connected to server individually whereas in bus topology all nodes are connected to server along a single length of cable.

Q9. Define the term firewall.

**Answer:**
Firewall is a feature used for Network Security. In a Network there is always danger of information leaking out or leaking in. Firewall is a feature which forces all information entering or leaving the network to pass through a check to make sure that there is no unauthorized usage of the network.
Q10. What is the importance of URL in networking?

Answer:
URL stands for Uniform Resource Locator. Each page that is created for Web browsing is assigned a URL that effectively serves as the page’s worldwide name or address. URL’s have three parts: the protocol, the DNS name of the machine on which the page is located and a local name uniquely indicating the specific page (generally the filename).

Long Answer Type Questions (5/4 marks)

Q1. PVS Computers decided to open a new office at Ernakulam, the office consist of Five Buildings and each contains number of computers. The details are shown below.

Distance between the buildings

<table>
<thead>
<tr>
<th>Building 1 and 2</th>
<th>20 Meters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building 2 and 3</td>
<td>50 Meters</td>
</tr>
<tr>
<td>Building 3 and 4</td>
<td>120 Meters</td>
</tr>
<tr>
<td>Building 3 and 5</td>
<td>70 Meters</td>
</tr>
<tr>
<td>Building 1 and 5</td>
<td>65 Meters</td>
</tr>
<tr>
<td>Building 2 and 5</td>
<td>50 Meters</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Building</th>
<th>No of computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>70</td>
</tr>
<tr>
<td>5</td>
<td>60</td>
</tr>
</tbody>
</table>

Computers in each building are networked but buildings are not networked so far. The Company has now decided to connect building also.

(i) Suggest a cable layout for connecting the buildings
(ii) Do you think anywhere Repeater required in the campus? Why
(iii) The company wants to link this office to their head office at Delhi
   (a) Which type of transmission medium is appropriate for such a link?
   (b) What type of network would this connection result into?
(iv) Where server is to be installed? Why?
(v) Suggest the wired Transmission Media used to connect all buildings efficiently.
Ans:-
(i) Any efficient layout with shortest Wire length
(ii) Between 3 and 4 due to larger distance
(iii) (a) Wireless
(a) WAN
(iv) Building-3 due to maximum no of Computers
(v) Co-axial cable or fiber optics

Q2. Riana Medicos Centre has set up its new centre in Dubai. It has four buildings as shown in the diagram given below:

Distance between various buildings is as follows:

<table>
<thead>
<tr>
<th>Distance</th>
<th>Meters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts to Research Lab</td>
<td>55</td>
</tr>
<tr>
<td>Accounts to Store</td>
<td>150</td>
</tr>
<tr>
<td>Store to Packaging Unit</td>
<td>160</td>
</tr>
<tr>
<td>Packaging Unit to Research Lab</td>
<td>60</td>
</tr>
<tr>
<td>Accounts to Packaging Unit</td>
<td>125</td>
</tr>
<tr>
<td>Store to Research Lab</td>
<td>180</td>
</tr>
</tbody>
</table>

Number of computers:

<table>
<thead>
<tr>
<th>Building</th>
<th>Computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts</td>
<td>25</td>
</tr>
<tr>
<td>Research Lab</td>
<td>100</td>
</tr>
<tr>
<td>Store</td>
<td>15</td>
</tr>
<tr>
<td>Packaging Unit</td>
<td>60</td>
</tr>
</tbody>
</table>

As a network expert, provide the best possible answer to the following queries:
(i) Suggest the type of network established between the buildings.
(ii) Suggest the most suitable place (i.e., building) to house the server of this organization.
(iii) Suggest the placement of the following devices with justification: Repeater, Switch
(iv) Suggest a system (hardware/software) to prevent unauthorized access to or from the network.
Ans. (i) LAN (Local Area Network)
(ii) Research Lab as it has the maximum number of computers.
(iii) (a) Repeater: It should be placed between Accounts and Packaging Unit, Accounts to Research Lab, Store to Research Lab and Accounts to Packaging Unit.
(b) Switch should be placed in each of the buildings for better traffic management.
(iv) Firewall.

Q3. “Bhartiya Connectivity Association” is planning to spread their offices in four major cities in India to provide regional IT infrastructure support in the field of Education & Culture. The company has planned to setup their head office in New Delhi in three locations and have named their New Delhi offices as “Front Office”, “Back Office” and “Work Office”. The company has three more regional offices as “South Office”, “East Office” and “West Office” located in other three major cities of India. A rough layout of the same is as follows:

Approximate distance between these offices as per network survey team is as follows:

<table>
<thead>
<tr>
<th>Place From</th>
<th>Place To</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>BackOffice</td>
<td>Front Office</td>
<td>10KM</td>
</tr>
<tr>
<td>Back Office</td>
<td>Work Office</td>
<td>70 Meter</td>
</tr>
<tr>
<td>Back Office</td>
<td>East Office</td>
<td>1291 KM</td>
</tr>
<tr>
<td>BackOffice</td>
<td>West Office</td>
<td>790 KM</td>
</tr>
<tr>
<td>Back Office</td>
<td>South Office</td>
<td>1952 KM</td>
</tr>
</tbody>
</table>

In continuation of the above, the company experts have planned to install the following number of computers in each of their offices:

<table>
<thead>
<tr>
<th>Office</th>
<th>Computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back Office</td>
<td>100</td>
</tr>
<tr>
<td>Front Office</td>
<td>20</td>
</tr>
<tr>
<td>Work Office</td>
<td>50</td>
</tr>
<tr>
<td>East Office</td>
<td>50</td>
</tr>
<tr>
<td>West Office</td>
<td>50</td>
</tr>
<tr>
<td>South Office</td>
<td>50</td>
</tr>
</tbody>
</table>
(i) Suggest network type (out of LAN, MAN, WAN) for connecting each of the following set of their offices:
- Back Office and Work Office
- Back Office and South Office

(ii) Which device you will suggest to be procured by the company for connecting all the computers with in each of their offices out of the following devices?
- Switch/Hub
- Modem
- Telephone

(iii) Which of the following communication medium, you will suggest to be procured by the company for connecting their local offices in New Delhi for very effective and fast communication?
- Telephone Cable
- Optical Fiber
- Ethernet Cable

(iv) Suggest a cable/wiring layout for connecting the company’s local offices located in New Delhi. Also, suggest an effective method/technology for connecting the company’s regional offices” “East Office”, “West Office” and “South Office” with offices located in New Delhi.

**Answer:**

(i) **Network type**: Head Office and Tech: LAN
   Head Office and Coimbatore Office: WAN

(ii) Switch/Hub

(iii) Optical fiber

(iv) (a) Optical Fiber/Star Topology

(b) Wireless
Q4. Knowledge Supplement Organization has set up its new center at Mangalore for its office and web based activities. It has 4 blocks of buildings as shown in the diagram below:

Center to center distances between various blocks

<table>
<thead>
<tr>
<th>Block A to Block B</th>
<th>50 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block B to Block C</td>
<td>150 m</td>
</tr>
<tr>
<td>Block C to Block D</td>
<td>25 m</td>
</tr>
<tr>
<td>Block A to Block D</td>
<td>170 m</td>
</tr>
<tr>
<td>Block B to Block D</td>
<td>125 m</td>
</tr>
<tr>
<td>Block A to Block C</td>
<td>90 m</td>
</tr>
</tbody>
</table>

Number of Computers

<table>
<thead>
<tr>
<th>Block A</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block B</td>
<td>50</td>
</tr>
<tr>
<td>Block C</td>
<td>125</td>
</tr>
<tr>
<td>Block D</td>
<td>10</td>
</tr>
</tbody>
</table>

a) Suggest a cable layout of connections between the blocks.

b) Suggest the most suitable block to house the server of this organisation with a suitable reason.

c) Suggest the placement of the following devices with justification

   (i) Repeater
   (ii) Hub/Switch

d) The organization is planning to link its front office situated in the city in a hilly region where cable connection is not feasible, suggest an economic way to connect it with reasonably high speed?
**Answer:**

(a) Any of the following option

**Layout Option 1:**

(b) The most suitable place / block to house the server of this organization would be Block C, as this block contains the maximum number of computers, thus decreasing the cabling cost for most of the computers as well as increasing the efficiency of the maximum computers in the network.

(c) For Layout 1, since the cabling distance between Blocks A and C, and that between B and C are quite large, so a repeater each, would ideally be needed along their path to avoid loss of signals during the course of data flow in these routes.

For layout 2, since the distance between Blocks A and C is large so a repeater would ideally be placed in between this path.

(d) The most economical way to connect it with a reasonable high speed would be to use radio wave transmission, as they are easy to install, can travel long distances, and penetrate buildings easily, so they are widely used for communication, both indoors and outdoors.
Q5. Ravya Industries has set up its new center at Kaka Nagar for its office and web based activities. The company compound has 4 buildings as shown in the diagram below:

Center to center distances between various buildings is as follows:

<table>
<thead>
<tr>
<th>Distance</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harsh Building to Raj Building</td>
<td>50 m</td>
</tr>
<tr>
<td>Raz Building to Fazz Building</td>
<td>60 m</td>
</tr>
<tr>
<td>Fazz Building to Jazz Building</td>
<td>25 m</td>
</tr>
<tr>
<td>Jazz Building to Harsh Building</td>
<td>170 m</td>
</tr>
<tr>
<td>Harsh Building to Fazz Building</td>
<td>125 m</td>
</tr>
<tr>
<td>Raj Building to Jazz Building</td>
<td>90 m</td>
</tr>
</tbody>
</table>

Number of Computers in each of the buildings is follows:

<table>
<thead>
<tr>
<th>Building</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harsh Building</td>
<td>15</td>
</tr>
<tr>
<td>Raj Building</td>
<td>150</td>
</tr>
<tr>
<td>Fazz Building</td>
<td>15</td>
</tr>
<tr>
<td>Jazz Building</td>
<td>25</td>
</tr>
</tbody>
</table>

a) Suggest a cable layout of connections between the buildings.

b) Suggest the most suitable place (i.e. building) to house the server of this organization with a suitable reason.

c) Suggest the placement of the following devices with justification:
   (i) Internet Connecting Device/Modem
   (ii) Switch

d) The organization is planning to link its sale counter situated in various parts of the same city, which type of network out of LAN, MAN or WAN will be formed? Justify your answer.
Answer:

a)

Layout 1:

b) the most suitable place (i.e. building) to house the server is Raj Building, as this block contains the maximum number of computers, thus decreasing the cabling cost for most of the computers as well as increasing the efficiency of the maximum computers in the network.

c) (i) Raj Building

(ii) In both the layouts, a hub/switch each would be needed in all the buildings, to interconnect the group of cables from the different computers in each block

d) The type of network that shall be formed to link the sale counters situated in various parts of the same city would be a MAN, because MAN (Metropolitan Area Networks) are the networks that link computer facilities within a city.
**ANSWER KEY (MCQs):**

<table>
<thead>
<tr>
<th>QUI</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANS</td>
<td>D</td>
<td>C</td>
<td>A</td>
<td>C</td>
<td>D</td>
<td>A</td>
<td>C</td>
<td>D</td>
<td>B</td>
<td>B</td>
</tr>
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<td>1</td>
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<tr>
<td>QUI</td>
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</tr>
<tr>
<td>QUI</td>
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<td>4</td>
<td>5</td>
</tr>
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<td>B</td>
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<td>B</td>
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<td>A</td>
<td>D</td>
<td>B</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>QUI</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
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<td>6</td>
</tr>
<tr>
<td>ANS</td>
<td>D</td>
<td>C</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>A</td>
<td>D</td>
<td>B</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>QUI</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
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<td>6</td>
<td>6</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>ANS</td>
<td>A</td>
<td>C</td>
<td>D</td>
<td>C</td>
<td>C</td>
<td>D</td>
<td>C</td>
<td>C</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>QUI</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
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<td>8</td>
</tr>
<tr>
<td>ANS</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>D</td>
<td>C</td>
<td>B</td>
<td>A</td>
<td>D</td>
<td>C</td>
<td>A</td>
</tr>
</tbody>
</table>
Database Management

**Tables/Relations**: Tables/relations are saved in the format of Tables. This format stores the relation among entities. A table has rows and columns, where rows represent records and columns represent attributes.

**Attribute**: Entities are represented by means of their properties, called attributes. All attributes have values.

**Tuple**: A single row of a table, which contains a single record for that relation is called a tuple.

**Degree**: The degree of a relation is the number of attributes in its header, or, in other words, the number of columns.

**Cardinality**: The cardinality of a relation is the number of tuples/records in a relation/table.
**Keys**

- **Primary Key**: A column or group of columns in a table that uniquely identifies every row in that table.

- **Candidate Key**: A set of attributes that uniquely identify tuples in a table and can become primary key.

- **Alternate Key**: All the candidate keys except primary key is are called alternate or secondary key.

- **Foreign Key**: A field (or collection of fields) in one table that refers to the PRIMARY KEY in another table.

---

A data definition language (DDL) is a language used to define data structures and modify data.

A data manipulation language (DML) is a language used for adding (inserting), deleting, and modifying (updating) data in a database.
### SQL Datatypes

- **Character**
  - `CHAR`, `VARCHAR`, `LONG CHAR`, `LONG VARCHAR`
- **Numeric**
  - `INT`, `DECIMAL`, `NUMERIC`, `REAL`, `FLOAT`
- **Date**
  - `DATE`, `TIME`

### DDL (Data Definition Language)
- **It is Data Definition Language**
- **These are used to define data structure**
- **It is used to define database structure or schema**
- **Commands are**: `CREATE`, `ALTER`, `DROP`, `TRUNCATE`, `RENAME`
- **It works on whole table**
- **It do not have a where clause to filter**
- **Changes done by DDL commands cannot be rolled back**
- **It is not further classified.**
- **Example**: `drop table tablename`

### DML (Data Manipulation Language)
- **It is Data Manipulation Language**
- **It is used to manipulate the existing databases.**
- **It is used for managing data within schema objects.**
- **Commands are**: `SELECT`, `INSERT`, `DELETE`, `UPDATE`, `MERGE`, `CALL`
- **It works on one or more rows**
- **It have where clause to filter records**
- **Changes can be rolled back**
- **It is further classified as procedural and non-procedural DML’s.**
- **Example**: `Select * from employee`
JOINS

Equi join

EQUI JOIN performs a JOIN against equality or matching column(s) values of the associated tables.

E.g.
```
select * from Table1, Table2 where Table1.col1=Table2.col2;
```

Natural join

Natural Join joins two tables based on same attribute name and datatypes. The resulting table will contain all the attributes of both the table but keep only one copy of each common column.

E.g.
```
select * from Table1 natural join
```
OBJECTIVE TYPE QUESTIONS /MULTIPLE CHOICE QUESTIONS

1. What is the full form of SQL?
   (a) Structured Query Language  (b) Structured Query List
   (c) Simple Query Language      (d) Data Derivation Language

2. What does DML stand for?
   (a) Different Mode Level        (b) Data Model Language
   (c) Data Mode Lane             (d) Data Manipulation Language

3. The ________ clause of SELECT query allows us to select only those rows in the results that satisfy a
   specified condition.
   (a) Where  (b) from  (c) having  (d) like

4. Which of the following function is used to FIND the largest value from the given data in MYSQL?
   (a) MAX ()  (b) MAXIMUM ()  (c) LARGEST ()  (d) BIG ()

5. The data types CHAR (n) and VARCHAR (n) are used to create ______ and ______ types of string/text
   fields in a database.
   (a) Fixed, equal  (b) Equal, variable  (c) Fixed, variable  (d) Variable, equal

6. The term __________ is use to refer to a record in a table.
   (a) Attribute  (b) Tuple  (c) Row  (d) Instance

7. Which command is used for cleaning up the environment (sql with Python)?
   (a) my.close  (b) is.close  (c) con.close  (d) mycon.close

8. A relational database consists of a collection of
   (a) Tables  (b) Fields  (c) Records  (d) Keys

9. What is the full form of DDL?
   (a) Dynamic Data Language  (b) Detailed Data Language
   (c) Data Definition Language  (d) Data Derivation Language

10. A(n) in a table represents a logical relationship among a set of values.
    (a) Attribute  (b) Key  (c) Tuple  (d) Entry

11. Name the method which is used for displaying only one resultset.
    (a) fetchmany  (b) fetchno  (c) fetchall  (d) fetchone

12. Name the host name used for signing in the database.
    (a) localhost  (b) localpost  (c) localcost  (d) none of the above

13. A relational database consists of a collection of
    (a)Tuples  (b) Attributes  (c) Relations  (d) Keys

14. Which is the subset of SQL commands used to manipulate database structure including tables?
    (a) Data Definition Language (DDL)  (b) Data Manipulation Language (DML)
    (c) Both (a) and (b)  (d) None

15. The term ___________ is used to refer to a field in a table.
    (a) Attribute  (b) Tuple  (c) Row  (d) Instance
16. Consider the following table namely employee:

<table>
<thead>
<tr>
<th>Employee_id</th>
<th>Name</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>5001</td>
<td>Amit</td>
<td>60000</td>
</tr>
<tr>
<td>5009</td>
<td>Sumit</td>
<td>45000</td>
</tr>
<tr>
<td>5020</td>
<td>Arpit</td>
<td>70000</td>
</tr>
</tbody>
</table>

Which of the names will not be displayed by the below given query?
SELECT name FROM employee WHERE employee_id>5009;
(a) Amit, Sumit  (b) Sumit, Arpit  (c) Arpit  (d) Amit, Arpit

17. Consider the following query
SELECT name FROM stu WHERE subject LIKE ‘_______ Computer Science’;
Which one of the following has to be added into the blank space to select the subject which has Computer Science as its ending string?
(a) $  (b) _  (c) ||  (d) %

18. Consider following SQL statement. What type of statement is this?
SELECT * FROM employee
(a) DML  (b) DDL  (c) DCL  (d) Integrity constraint

19. Which of the following function is not an aggregate function?
(a) Round()  (b) Sum()  (c) Count ()  (d) Avg ()

20. Pick the correct username used for logging in database (sql with Python).
(a) root  (b) local  (c) directory  (d) host

21. Aggregate functions can be used in the select list or the _____ clause of a select statement. They cannot be used in a _____ clause.
(a) Where, having  (b) Having, where  (c) Group by, having  (d) Group by, where

22. Select correct SQL query from below to find the temperature in increasing order of all cites.
(a) SELECT city FROM weather ORDER BY temperature;
(b) SELECT city, temperature FROM weather;
(c) SELECT city, temperature FROM weather ORDER BY temperature;
(d) SELECT city, temperature FROM weather ORDER BY city;

23. In SQL, which command is used to SELECT only one copy of each set of duplicable rows
(a) SELECT DISTINCT  (b) SELECT UNIQUE  (c) SELECT DIFFERENT  (d) All of the above

24. Which of the following is a SQL aggregate function?
(a) LEFT  (b) AVG  (c) JOIN  (d) LEN

25. The command used for modifying the records is:
(a) update  (b) add  (c) updateall  (d) none of the above

26. An attribute in a relation is foreign key if it is the _______key in any other relation.
(a) Candidate  (b) Primary  (c) Super  (d) Sub
27. Which of the following sublanguages of SQL is used to query information from the database and to insert tuples into, delete tuples from, and modify tuples in the database?
   (a) DML (Data Manipulation Language)
   (b) DDL (Data Definition Language)
   (c) Query
   (d) Relational Schema

28. Which operator performs pattern matching?
   (a) BETWEEN operator
   (b) LIKE operator
   (c) EXISTS operator
   (d) None of these

29. Which of the following is not a legal method for fetching records from database from within Python?
   (a) fetchone()
   (b) fetchtwo()  
   (c) fetchall()  
   (d) fetchmany()

30. By default, ORDER BY clause lists the results in ______ order.
   (a) Descending
   (b) Any
   (c) Same
   (d) Ascending

31. Which of the following attributes can be considered as a choice for primary key?
   (a) Name
   (b) Street
   (c) Roll No
   (d) Subject

32. In the given query which keyword has to be inserted?
   
   INSERT INTO employee_______(1002, “Kausar”, 2000);
   (a) Table
   (b) Values
   (c) Relation
   (d) Field

33. What SQL statement do we use to display the record of all students whose last name contains 5 letters ending with “A”? 
   (a) SELECT * FROM STUDENTS WHERE LNAME LIKE ‘_ _ _ _ A’;
   (b) SELECT * FROM STUDENTS WHERE LNAME LIKE ‘_ _ _ _ _’;
   (c) SELECT * FROM STUDENTS WHERE LNAME LIKE ‘?????A’;
   (d) SELECT * FROM STUDENTS WHERE LNAME LIKE ‘*A’;

34. Consider the table with structure as: 
   Student (ID, name, dept name, tot_cred)
   In the above table, which attribute will form the primary key?
   (a) Name
   (b) Dept
   (c) total_credits
   (d) ID

35. Which of the following will you use in the following query to display the unique values of the column dept_name?
   SELECT _____________ dept_name FROM Company;
   (a) All
   (b) From
   (c) Distinct
   (d) Name

36. Consider the following query:
   SELECT name, instructor name, course______id
   FROM instructor;
   To display the field heading course with a different heading as id, which keyword must be used here to rename the field name?
   (a) From
   (b) Rename
   (c) As
   (d) Join

37. With SQL, how do you select all the records from a table named “Students” where the value of the column “FirstName” ends with an “a”?
   (a) SELECT * FROM Students WHERE FirstName =’a’
   (b) SELECT * FROM Students WHERE FirstName LIKE ‘a%’
   (c) SELECT * FROM Students WHERE FirstName LIKE ‘%a’
   (d) SELECT * FROM Students WHERE FirstName =”%a%”
38. The HAVING clause does which of the following?
   (a) Acts EXACTLY like WHERE clause
   (b) Acts like a WHERE clause but is used for columns rather than groups.
   (c) Acts like a WHERE clause but is used form groups rather than rows.
   (d) Acts like a WHERE clause but is used for rows rather than columns.

39. Which clause is used with “aggregate functions”?
   (a) GROUP BY  (b) SELECT  (c) WHERE  (d) Both (a) and (b)

40. To open a connector to Mysql database, which statement is used to connect with mysql?
   (a) Connector  (b) Connect  (c) password  (d) username

41. If column “Marks” contains the data set {25, 35, 25, 35, 38}, what will be the output after the execution
   of the given query?
   SELECT MARKS (DISTINCT) FROM STUDENTS;
   (a) 25. 35. 25. 35. 38  (b) 25, 25, 35, 35  (c) 25, 35, 38  (d) 25, 25, 35, 35

42. Which connector is used for linking the database with Python code?
   (a) MySQL-connector  (b) YesSQL: connector
   (c) PostSQL: connector  (d) None of the above

43. If column “Salary” contains the data set {1000, 15000, 25000, 10000, 15000}, what will be the output
   after the execution of the given query?
   SELECT SUM(DISTINCT SALARY) FROM EMPLOYEE;
   (a) 75000  (b) 25000  (c) 10000  (d) 50000

44. SQL applies conditions on the groups through _____ clause after groups have been formed,
   (a) Group by  (b) With  (c) Where  (d) Having

45. To execute all the rows from the result set, which method is used?
   (a) fetchall  (b) fetchone  (c) fetchmany  (d) none of the above

46. What is the meaning of “HAVING” clause is SELECT query?
   (a) To filter out the summary groups  (b) To filter out the column groups
   (c) To filter out the row and column values  (d) None of the mentioned

47. Which of the following queries contains an error?
   (a) Select * from emp where empid = 10003;
   (b) Select empid from emp where empid=10006;
   (c) Select empid from emp;
   (d) Select empid where empid=1009 and lastname=’GUPTA’;

48. Which operator tests column for the absence of data (i.e., NULL value) ?
   (a) EXISTS operator  (b) NOT operator
   (c) IS operator  (d) None of these

49. Consider the following query:
   SELECT name FROM class WHERE subject_____NULL;
   Which comparison operator may be used to fill the blank space in above query?
   (a) =  (b) LIKE  (c) IS/IS Not  (d) if
50. Which SQL function is used to count the number of rows in a SQL query?  
   (a) COUNT ()  
   (b) NUMBER ()  
   (c) SUM ()  
   (d) COUNT (*)  

51. With SQL, how can you return the number of not null record in the Project field of “Students” table?  
   (a) SELECT COUNT (Project) FROM Students  
   (b) SELECT COLUMNS (Project) FROM Students  
   (c) SELECT COLUMNS (*) FROM Students  
   (d) SELECT COUNT (*) FROM Students  

52. Which of the following is not an aggregate function?  
   (a) Avg  
   (b) Sum  
   (c) With  
   (d) Min  

53. All aggregate functions except _______ ignore null values in their input collection.  
   (a) Count (attribute)  
   (b) Count (*)  
   (c) Avg  
   (d) Sum  

54. Which of the following group functions ignore NULL values?  
   (a) MAX  
   (b) COUNT  
   (c) SUM  
   (d) All of the above  

55. What will be the order of the data being sorted after the execution of given query  
   SELECT * FROM STUDENT ORDER BY ROLL_NO;  
   (a)Custom Sort  
   (b) Descending  
   (c) Ascending  
   (d) None of the above  

56. Where and Having clauses can be used interchangeably in SELECT queries?  
   (a) True  
   (b) False  
   (c) Only in views  
   (d) With order by  

57. A______ is property of the entire relation, which ensures through its value that each tuple is unique in a relation.  
   (a) Rows  
   (b) Key  
   (c) Attribute  
   (d) fields  

58. The operation whose result contains all pairs of tuples from the two relations, regardless of whether their attribute values match.  
   (a) Join  
   (b) Cartesian product  
   (c) Intersection  
   (d) Set difference  

59. Consider following SQL statement. What type of statement is this?  
   CREATE TABLE employee (name VARCHAR, id INTEGER)  
   (a) DML  
   (b) DDL  
   (c) DCL  
   (d) Integrity constraint  

60. The pattern ‘- - - ’ matches any string of _______ three character. ‘- - - %’ matches any string of ____ three characters.  
   (a) Atleast, Exactly  
   (b) Exactly, Atleast  
   (c) Atleast, All  
   (d) All, Exactly
VERY SHORT ANSWER QUESTIONS (1 MARKS EACH)

Q1. Name the command/clause which is used to display the records in ascending or descending order.
Q2. Give example of any two DML commands.
Q3. What is the purpose of SQL?
Q4. What is primary key?
Q5. Which command is used to display a list of already existing tables?
Q6. Which command is used to change the structure of table?
Q7. Which command is used to change the data of the table?
Q8. Which command is used to delete data of the table?
Q9. Which command delete the structure of table?
Q10. Identify the DDL and DML commands from the following:
    Create, Delete
Q11. Which clause is used with aggregate functions? (Group by/ Where)
Q12. What do you mean by candidate key?
Q13. Correct the error in the following query.
    Select * from RECORD where Rname = %math%;
Q14. What is max () function in SQL?
Q15. What do you mean by degree and cardinality of table?
Q16. Expand DDL and DML
Q17. Which command is used to increase the salary of workers in table salary? (Update / Alter)
Q18. Name the command used to see the structure of table.
Q19. Which aggregate function is used to find sum of column in a table?
Q20. What is the difference between having and where clause?
Q21. Name an aggregate function in SQL which return the average of numeric values.
Q22. What is the use of “like” in SQL?
Q23. Correct the following statement:
    Delete table data;
Q24. What do you mean by aggregate function?
Q25. Write two wild card characters which are used with like operator?
Q26. Duplication of record is called ____________
Q27. What is the difference between char and varchar?

============================================*===================================
Fill in the blanks

1. SQL stands for _______ Query Language.
2. A connectivity package such as _______ must be imported before writing database connectivity Python code.
3. The SQL keyword_______ is used to specify the table(s) that contains the data to be retrieved.
4. To remove duplicate rows from the result of a query, specify the SQL qualifier_______ in select list.
5. To obtain all columns, use a(n) ________ instead of listing all the column names in the select list.
6. The SQL ______ clause contains the condition that specifies which rows are to the selected.
7. To sort the rows of the result table, the _______ ________ clause is specified.
8. Columns can be sorted in descending sequence by using the SQL keyword _______.
9. When two conditions must both be true for the rows to be selected, the conditions are separated by the SQL keyword ________.
10. To refer to a set of values needed for a condition, we can use the SQL operation _________.
11. To exclude one or more values (a list of values) using a condition, the SQL keyword ________ should be used.
12. The SQL keyword _______ is used in SQL expressions to select based on patterns
13. The SQL built-in function ________ totals values in numeric columns.
14. The SQL built-in function ________ obtains the largest value in a numeric column.
15. The SQL built-in function ________ obtains the smallest value in a numeric column.
16. The SQL built-in function ________ computes the number of rows in a table.
17. The SELECT clause ________ is used to collect those rows that have the same value in a specified column.
18. ______________ method returns the result set in the form of tuples containing the records or rows returned by the sql table.
19. A session between the application program and the database is called___________.
20. A _________ query is used to check if data has been added to the table or not.
21. The ______________ function works with data of multiple rows at a time and returns aggregated value.
22. The _____ clause lets you arrange the result set in the order of single column, multiple column and custom sort order too.
23. To specify filtering condition for groups, the ______________ clause is used in MYSQL.
24. By default, the ORDER BY clauses sorts the result set in the _________ order.
25. To sort the result set in descending order, ___________ keyword is used with ORDER BY.

True/False Questions

1. The condition in a WHERE clause in a SELECT query can refer to only one value
2. SQL provides the AS keyword, which can be used to assign meaningful column names to the results of queries using the SQL built-in functions.
3. The rows of the result relation produced by a SELECT statement can be sorted but only by one column.
4. SQL is a programming language.
5. SELECT DISTINCT is used if a user wishes to see duplicate columns in a query.
6. The HAVING clause acts like a WHERE clause, but it identifies groups that meet a criterion, rather than rows.
7. The qualifier DISTINCT must be used in an SQL statement when we want to Eliminate duplicate rows.
8. DISTINCT and its counterpart, ALL, can be used more than once in a SELECT statement.
9. DISTINCT and its counterpart, ALL, can be used together on single field in a SELECT statement.
10. SUM, AVG, MIN and MAX can only be used with numeric columns.
11. The SQL statement: SELECT salary + Comm AS Total FROM Emp; adds two fields salary and comm from each row together and lists the results in a column named Total.

12. ORDER BY can be combined with the SELECT statement.
13. Data manipulation language (DML) commands are used to define a database, including creating, altering, and dropping tables and establishing constraints.
14. The keyword LIKE can be used in a WHERE clause to refer to a range of values.
15. The SQL keyword GROUP BY instructs the DBMS to group together those rows that have the same value in a column.
16. The keyword BETWEEN can be used in a WHERE clause to refer to a range of values.
17. Read operation on any table means to fetch some useful information from the table.
18. Use fetchall() method to retrieve only one value from a database table.
19. Row count is a read-only attribute.
20. To disconnect database connection, use connect () method.
21. Update statement is used to insert data into the table.
22. The ORDER BY clause combines all those records that have identical values in a particular field or a group of fields.
23. The WHERE clause is used to specify filtering conditions for groups.
24. DISTINCT option causes a group function to consider only the unique values of the argument expression.
25. By default, ORDER BY clause sorts the result set in descending order.
26. COUNT () function ignores duplicate and null values while counting the records.
27. The return value of MAX () function is a numeric value.
28. Multiple row function is also known as scalar function
29. SUM () function is used to count the total number of records in a table.
30. Argument type of AVG () function can be numeric or string data type.
## ANSWER
### OBJECTIVE TYPE QUESTIONS /MULTIPLE CHOICE QUESTIONS

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<td>(a) SELECT * FROM STUDENTS WHERE LNAME LIKE'____A';</td>
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<td>(c) SELECT * FROM Students WHERE FirstName LIKE '%a'</td>
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<td>(c) Acts like a WHERE clause but is used from groups rather than rows</td>
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<td>A field which is unique for each and every record in table is called primary key.</td>
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<td>show tables;</td>
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<td>Create —DDL and Delete —DML</td>
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<td>Select * from RECORD where Rname like %math%;</td>
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<td>Ans. It returns the largest value from a particular column.</td>
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<td>Ans. DDL – Data Definition Language, DML – Data Manipulation Language.</td>
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<td>sum()</td>
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<td>Having clause can be used with group by clause while where clause can be used without group by clause.</td>
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<td>“Like” operator is used to match a particular pattern in a particular column in SQL.</td>
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---ANSWER---

Fill in the blanks

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---ANSWER---

True and False

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</table>
Q1. What is the difference between cardinality and degree?

Q2. Differentiate between WHERE and HAVING clause.

Q3. Define Primary Key of a relation in SQL. Give an example using a dummy table.

Q4. Consider the following Python code is written to access the record of CODE passed to function: Complete the missing statements:

```python
def Search(eno):
    # Assume basic setup import, connection and cursor is created
    query="select * from emp where empno=________".format(eno)
    mycursor.execute(query)
    results = mycursor._________
    print(results)
```

Q5. Differentiate between DDL and DML with one example each.

Q6. Answer the following:
   i) Name the package for connecting Python with MySQL database.
   ii) What is the purpose of cursor object?

Q7. What do you mean by domain of an attribute in DBMS? Explain with an example.

Q8. Differentiate between fetchone() and fetchmany() methods with suitable examples.

Q9. What is Constraint? Give examples of any two constraints.

Q10. Write the steps to perform an Insert query in database connectivity application.

Q11. Define Candidate Key and Alternate Key with suitable examples from a table containing some meaningful data.

Q12. Define RDBMS. Name any two RDBMS software.

Q13. What is the purpose of the following clauses in a select statement?
   i) ORDER BY
   ii) HAVING

Q14. Write SQL queries for the following:
   i. Create the table Product with appropriate data types and constraints.
   ii. Identify the primary key in Product.

Q15. Write any two differences between Single_row functions and Aggregate functions.

**ANSWERS**-(SHORT ANSWER QUESTIONS (2 MARKS EACH))

**ANS.1 Degree** - The number of attributes or columns in a relation is called the Degree of the relation.

**Cardinality** - The number of tuples/rows in a relation is called the Cardinality of the relation.

**ANS.2 WHERE clause** is used to select particular rows that satisfy a condition whereas HAVING clause is used in connection with the aggregate function, GROUP BY clause.

For ex. – select * from student where marks > 75;

This statement shall display the records for all the students who have scored more than 75 marks.

On the contrary, the statement – select * from student group by stream having marks > 75; shall display the records of all the students grouped together on the basis of stream but only for those students who have scored marks more than 75.

**Ans.3 Primary Key** - one or more attribute of a relation used to uniquely identify each and every tuple in the relation. For Example: In the below Table Student, RollNo can be the Primary Key

<table>
<thead>
<tr>
<th>RollNo</th>
<th>Name</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pratham</td>
<td>75</td>
</tr>
<tr>
<td>2</td>
<td>Srishti</td>
<td>80</td>
</tr>
</tbody>
</table>

Ans 4  { } and fetchone()

**Ans 5 DDL** - Data definition language. Consists of commands used to modify the metadata of a table. For Example- create table, alter table, drop table

**DML** - Data manipulation language. Consist of commands used to modify the data of a table.

For Example- insert, delete, update

Ans 6 . i) import mysql.connector
ii) It is the object that helps to execute the SQL queries and facilitate row by row processing of records in the resultset.

Ans 7 Domain of an attribute is the set of values from which a value may come in a column. E.g. Domain of section field may be (A,B,C,D).

Ans 8 fetchone() is used to retrieve one record at a time but fetchmany(n) will fetch n records at a time from the table in the form of a tuple.

Ans 9 .Constraints are the checking condition which we apply on table to ensure the correctness of data . Example primary key, not null, default, unique etc

Ans 10 import mysql.connector as mydb
    conn= mydb.connect(host="localhost", user="root", passwd="1234")
    cur=conn.cursor()
    cur.execute("INSERT INTO student values(10,'Ashok',26);")
    cur.commit()

Ans.11 A table may have more than one such attribute/group of attributes that identifies a tuple uniquely, all such attribute(s) are known as Candidate Keys. All the candidate key except primary key are called Alternate key.

Table: Employee (empno, aadhar_no, voter_id, ename, deptno, sal, city)
In the above table Employee, empno,aadhar_no, voter_id all are candidate key If we define empno as primary key then remaining candidate keys will be alternate key.

Ans.12 RDBMS stands for Relational Database Management System. It is a program that offers commands to create, update, and manage the data with multiple tables. Examples of RDBMS are
    1. MySQL
    2. Oracle
    3. Microsoft SQL Server.

Ans.13
i) Order By : This clause is used to arrange the records in ascending or descending order. for example Select * from book order by price;
ii) HAVING : HAVING Clause in SQL is used to specify conditions on the rows with GROUP BY clause. for example Select sum(price) from book group by (subject) having price > 100;

Ans 14.
i) Create table product(Pcode varchar(3) not null Primary key , PName Varchar(20),
    UPrice int(4), Manufacture Varchar(20));
ii) Pcode is primary key.

Ans.15

<table>
<thead>
<tr>
<th>Single row Functions</th>
<th>Multiple row functions / Aggregate Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>It operates on a single row at a time.</td>
<td>It operates on multiple rows.</td>
</tr>
<tr>
<td>It returns one result per row</td>
<td>It returns one result for multiple rows.</td>
</tr>
<tr>
<td>It can be used in Select, Where, and Order by clause.</td>
<td>It can be used in the select clause only.</td>
</tr>
<tr>
<td>Math, String and Date functions are examples of single row functions.</td>
<td>Max(), Min(), Avg(), Sum(), Count() and Count(*) are examples of multiple row functions.</td>
</tr>
</tbody>
</table>
CASE STUDY BASED QUESTIONS/SQL-OUTPUT QUESTIONS (3 MARKS)

Q1. Consider the following tables FACULTY and COURSES and give outputs for SQL queries (i) to (iii)

<table>
<thead>
<tr>
<th>F_ID</th>
<th>Fname</th>
<th>Lname</th>
<th>Hire_date</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>Amit</td>
<td>Mishra</td>
<td>12-10-1998</td>
<td>12000</td>
</tr>
<tr>
<td>103</td>
<td>Nitin</td>
<td>Vyas</td>
<td>24-12-1994</td>
<td>8000</td>
</tr>
<tr>
<td>104</td>
<td>Rakshit</td>
<td>Soni</td>
<td>18-5-2001</td>
<td>14000</td>
</tr>
<tr>
<td>105</td>
<td>Rashmi</td>
<td>Malhotra</td>
<td>11-9-2004</td>
<td>11000</td>
</tr>
<tr>
<td>106</td>
<td>Sulekha</td>
<td>Srivastava</td>
<td>5-6-2006</td>
<td>10000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C_ID</th>
<th>F_ID</th>
<th>Name</th>
<th>Fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>C21</td>
<td>102</td>
<td>Grid Computing</td>
<td>40000</td>
</tr>
<tr>
<td>C22</td>
<td>106</td>
<td>System Design</td>
<td>16000</td>
</tr>
<tr>
<td>C23</td>
<td>104</td>
<td>Computer Security</td>
<td>8000</td>
</tr>
<tr>
<td>C24</td>
<td>106</td>
<td>Human Biology</td>
<td>15000</td>
</tr>
<tr>
<td>C25</td>
<td>102</td>
<td>Computer Network</td>
<td>20000</td>
</tr>
<tr>
<td>C26</td>
<td>105</td>
<td>Visual Basic</td>
<td>6000</td>
</tr>
</tbody>
</table>

i) Select COUNT(DISTINCT F_ID) from COURSES;

ii) Select MIN(Salary) from FACULTY,COURSES where COURSES.F_ID =FACULTY.F_ID;

iii) Select avg(Salary) from FACULTY where Fname like ‘R%’

Q.2 Write output for (i) & (iii) based on a table COMPANY and CUSTOMER.

<table>
<thead>
<tr>
<th>CID</th>
<th>NAME</th>
<th>CITY</th>
<th>PRODUCTNAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>SONY</td>
<td>DELHI</td>
<td>TV</td>
</tr>
<tr>
<td>222</td>
<td>NOKIA</td>
<td>MUMBAI</td>
<td>MOBILE</td>
</tr>
<tr>
<td>333</td>
<td>ONIDA</td>
<td>DELHI</td>
<td>TV</td>
</tr>
<tr>
<td>444</td>
<td>SONY</td>
<td>MUMBAI</td>
<td>MOBILE</td>
</tr>
<tr>
<td>555</td>
<td>BLACKBERRY</td>
<td>MADRAS</td>
<td>MOBILE</td>
</tr>
<tr>
<td>666</td>
<td>DELL</td>
<td>DELHI</td>
<td>LAPTOP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CUSTID</th>
<th>NAME</th>
<th>PRICE</th>
<th>QTY</th>
<th>CID</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Rohan Sharma</td>
<td>70000</td>
<td>20</td>
<td>222</td>
</tr>
<tr>
<td>102</td>
<td>Deepak Kumar</td>
<td>50000</td>
<td>10</td>
<td>666</td>
</tr>
<tr>
<td>103</td>
<td>Mohan Kumar</td>
<td>30000</td>
<td>5</td>
<td>111</td>
</tr>
<tr>
<td>104</td>
<td>Sahil Bansal</td>
<td>35000</td>
<td>3</td>
<td>333</td>
</tr>
<tr>
<td>105</td>
<td>Neha Soni</td>
<td>25000</td>
<td>7</td>
<td>444</td>
</tr>
<tr>
<td>106</td>
<td>Sonal Aggarwal</td>
<td>20000</td>
<td>5</td>
<td>333</td>
</tr>
</tbody>
</table>
(i) SELECT COUNT(*) ,CITY FROM COMPANY GROUP BY CITY;
(ii) SELECT MIN(PRICE), MAX(PRICE) FROM CUSTOMER WHERE QTY>10 ;
(iii) SELECT AVG(QTY) FROM CUSTOMER WHERE NAME LIKE "%r%";

Q.3 Write output for (i) to (iii) based on the tables ‘Watches’ and ‘Sale’ given below.

<table>
<thead>
<tr>
<th>Watchid</th>
<th>Watch_Name</th>
<th>Price</th>
<th>Type</th>
<th>Qty_Store</th>
</tr>
</thead>
<tbody>
<tr>
<td>W001</td>
<td>HighTime</td>
<td>10000</td>
<td>Unisex</td>
<td>100</td>
</tr>
<tr>
<td>W002</td>
<td>LifeTime</td>
<td>15000</td>
<td>Ladies</td>
<td>150</td>
</tr>
<tr>
<td>W003</td>
<td>Wave</td>
<td>20000</td>
<td>Gents</td>
<td>200</td>
</tr>
<tr>
<td>W004</td>
<td>HighFashion</td>
<td>7000</td>
<td>Unisex</td>
<td>250</td>
</tr>
<tr>
<td>W005</td>
<td>GoldenTime</td>
<td>25000</td>
<td>Gents</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Watchid</th>
<th>Qty_Sold</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>W001</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>W003</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>W002</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>W003</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>W001</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>W002</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>W005</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>W003</td>
<td>15</td>
<td>4</td>
</tr>
</tbody>
</table>

i. select quarter, sum(qty_sold) from sale group by quarter;
ii. select watch_name,price,type from watches w, sale s where w.watchid!=s.watchid;
iii. select watch_name, qty_store, sum(qty_sold), qty_store-sum(qty_sold) “Stock” from watches w, sale s where w.watchid=s.watchid group by w.watchid;

Q.4 Write the output for SQL queries (i) to (iii), which are based on the table: Employees

<table>
<thead>
<tr>
<th>Empid</th>
<th>Firstname</th>
<th>Lastname</th>
<th>Designation</th>
<th>City</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>010</td>
<td>Ravi</td>
<td>Kumar</td>
<td>Manager</td>
<td>GZB</td>
<td>75000</td>
</tr>
<tr>
<td>105</td>
<td>Harry</td>
<td>Waltor</td>
<td>Manager</td>
<td>GZB</td>
<td>65000</td>
</tr>
<tr>
<td>152</td>
<td>Sam</td>
<td>Tones</td>
<td>Director</td>
<td>Paris</td>
<td>80000</td>
</tr>
<tr>
<td>215</td>
<td>Sarah</td>
<td>Ackerman</td>
<td>Manager</td>
<td>Upton</td>
<td>75000</td>
</tr>
<tr>
<td>244</td>
<td>Manila</td>
<td>Sengupta</td>
<td>Clerk</td>
<td>New Delhi</td>
<td>50000</td>
</tr>
<tr>
<td>300</td>
<td>Robert</td>
<td>Samuel</td>
<td>Clerk</td>
<td>Washington</td>
<td>45000</td>
</tr>
<tr>
<td>335</td>
<td>Ritu</td>
<td>Tondon</td>
<td>Clerk</td>
<td>GZB</td>
<td>40000</td>
</tr>
<tr>
<td>400</td>
<td>Rachel</td>
<td>Lee</td>
<td>Salesman</td>
<td>New York</td>
<td>32000</td>
</tr>
<tr>
<td>441</td>
<td>Peter</td>
<td>Thompson</td>
<td>Salesman</td>
<td>Paris</td>
<td>28000</td>
</tr>
</tbody>
</table>

(i) Select Designation , count(*) from Employees Group by Designation Having count(*)>=3;
(ii) Select Max (salary), Min(Salary) from Employees Where City in ('GZB', 'Paris');
(iii) Select Firstname, Lastname from Employees where Firstname like 'R%';

Q.5 Write output for queries (i) to (iii), which are based on the table:

Books.

<table>
<thead>
<tr>
<th>Book_id</th>
<th>Book_name</th>
<th>Author_name</th>
<th>Publisher</th>
<th>Price</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>C0001</td>
<td>Fast Cook</td>
<td>Lata Kapoor</td>
<td>EPB</td>
<td>355</td>
<td>5</td>
</tr>
<tr>
<td>F0001</td>
<td>The Tears</td>
<td>William hopkin</td>
<td>NIL</td>
<td>650</td>
<td>20</td>
</tr>
<tr>
<td>T0001</td>
<td>My First Py</td>
<td>Brain&amp; Brooke</td>
<td>EPB</td>
<td>350</td>
<td>10</td>
</tr>
<tr>
<td>T0002</td>
<td>Brain works</td>
<td>A.W. Rossaine</td>
<td>TDH</td>
<td>450</td>
<td>15</td>
</tr>
<tr>
<td>F0002</td>
<td>Thunderbolts</td>
<td>Anna Roberts</td>
<td>NIL</td>
<td>750</td>
<td>5</td>
</tr>
</tbody>
</table>

i. Select Count(Publisher) from Books;

ii. Select Max(Price) from books where qty >=15;

iii. Select count(distinct publishers) from books where Price>=400;

**ANSWERS**

ANS .1 (i) 4 (ii) 6000 (iii) 12500

Ans.2

(i) Count(*)

CITY

3 DELHI

2 MUMBAI

1 MADRAS

(ii) MIN (PRICE) -50000

MAX (PRICE) -7000

(iii) AVG (QTY)

11

Ans.3

(i) Quarter sum(qty_sold)

1 15

2 30

3 45

4 15

(ii) watch_name price type

HighFashion 7000 Unisex

(iii) watch_name qty_store qty_sold Stock

HighTime 100 25 75

LifeTime 150 40 110

Wave 200 30 170

GoldenTime 100 10 90

Ans4.

(i) Manager 3

Clerk 3

(ii) 80000 28000

(iii) Ravi Kumar

Robert Samuel
Table: GRADUATE

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>NAME</th>
<th>STIPEND</th>
<th>SUBJECT</th>
<th>AVERAGE</th>
<th>DIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>KARAN</td>
<td>400</td>
<td>PHYSICS</td>
<td>68</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>DIVAKAR</td>
<td>450</td>
<td>COMPUTER SC</td>
<td>68</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>DIVYA</td>
<td>300</td>
<td>CHEMISTRY</td>
<td>62</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>ARUN</td>
<td>350</td>
<td>PHYSICS</td>
<td>63</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>SABINA</td>
<td>500</td>
<td>MATHEMATICS</td>
<td>70</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>JOHN</td>
<td>400</td>
<td>CHEMISTRY</td>
<td>55</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>ROBERT</td>
<td>250</td>
<td>PHYSICS</td>
<td>64</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>RUBINA</td>
<td>450</td>
<td>MATHEMATICS</td>
<td>68</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>VIKAS</td>
<td>500</td>
<td>COMPUTER SC</td>
<td>62</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>MOHAN</td>
<td>300</td>
<td>MATHEMATICS</td>
<td>57</td>
<td>2</td>
</tr>
</tbody>
</table>

(a) List the names of those students who have obtained DIV 1 sorted by NAME.
(b) Display a report, listing NAME, STIPEND, SUBJECT and amount of stipend received in a year assuming that the STIPEND is paid every month.
(c) To count the number of students who are either PHYSICS or COMPUTER SC graduates.
(d) To insert a new row in the GRADUATE table:
   11, “KAJOL”, 300, “COMPUTER SC”, 75, 1
(e) Display Name of the students whose average is more than 65.

Q.2 Write SQL commands for (a) to (e) on the basis of table CLUB.

Table: CLUB

<table>
<thead>
<tr>
<th>COACH H ID</th>
<th>COACH NAME</th>
<th>AGE</th>
<th>SPORTS</th>
<th>DATEOFAP</th>
<th>PAY</th>
<th>SEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>KUKREJA</td>
<td>35</td>
<td>KARATE</td>
<td>27/03/1997</td>
<td>1000</td>
<td>M</td>
</tr>
<tr>
<td>2.</td>
<td>RAVINA</td>
<td>34</td>
<td>KARATE</td>
<td>20/01/1998</td>
<td>1200</td>
<td>F</td>
</tr>
<tr>
<td>3.</td>
<td>KARAN</td>
<td>34</td>
<td>SQUASH</td>
<td>19/02/1998</td>
<td>2000</td>
<td>M</td>
</tr>
<tr>
<td>4.</td>
<td>TARUN</td>
<td>33</td>
<td>BASKETBALL</td>
<td>01/01/1998</td>
<td>1500</td>
<td>M</td>
</tr>
<tr>
<td>5.</td>
<td>ZUBIN</td>
<td>36</td>
<td>SWIMMING</td>
<td>12/01/1998</td>
<td>750</td>
<td>M</td>
</tr>
<tr>
<td>6.</td>
<td>KETAKI</td>
<td>36</td>
<td>SWIMMING</td>
<td>24/02/1998</td>
<td>800</td>
<td>F</td>
</tr>
<tr>
<td>7.</td>
<td>ANKITA</td>
<td>39</td>
<td>SQUASH</td>
<td>20/02/1998</td>
<td>2200</td>
<td>F</td>
</tr>
<tr>
<td>8.</td>
<td>ZAREEN</td>
<td>37</td>
<td>KARATE</td>
<td>20/02/1998</td>
<td>1100</td>
<td>F</td>
</tr>
<tr>
<td>9.</td>
<td>KUSH</td>
<td>41</td>
<td>SWIMMING</td>
<td>13/01/1998</td>
<td>900</td>
<td>M</td>
</tr>
<tr>
<td>10.</td>
<td>SHAILYA</td>
<td>37</td>
<td>BASKETBALL</td>
<td>19/02/1998</td>
<td>1700</td>
<td>M</td>
</tr>
</tbody>
</table>
(a) To show all information about the swimming coaches in the club.
(b) To list names of all coaches with their date of appointment (DATOFAPP) in descending order.
(c) To display a report, showing coachname, pay, age and bonus (15% of pay) for all the coaches.
(d) To insert in a new row in the CLUB table with the following data:
(e ) Display Coachname ,Sports,Pay from the table.

3. Write SQL command for (a) to (e) on the basis of tables INTERIORS and NEWONES.

<table>
<thead>
<tr>
<th>Table: INTERIORS</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>ITEMNAME</td>
<td>TYPE</td>
<td>DATEOFSTOCK</td>
<td>PRICE</td>
</tr>
<tr>
<td>1</td>
<td>Red rose</td>
<td>Double bed</td>
<td>23/02/02</td>
<td>32000</td>
</tr>
<tr>
<td>2</td>
<td>Soft touch</td>
<td>Baby cot</td>
<td>20/01/02</td>
<td>9000</td>
</tr>
<tr>
<td>3</td>
<td>Jerry’s home</td>
<td>Baby cot</td>
<td>19/02/02</td>
<td>8500</td>
</tr>
<tr>
<td>4</td>
<td>Rough wood</td>
<td>Office Table</td>
<td>01/01/02</td>
<td>20000</td>
</tr>
<tr>
<td>5</td>
<td>Comfort zone</td>
<td>Double bed</td>
<td>12/01/02</td>
<td>15000</td>
</tr>
<tr>
<td>6</td>
<td>Jerry look</td>
<td>Baby cot</td>
<td>24/02/02</td>
<td>7000</td>
</tr>
<tr>
<td>7</td>
<td>Lion king</td>
<td>Office Table</td>
<td>20/02/02</td>
<td>16000</td>
</tr>
<tr>
<td>8</td>
<td>Royal tiger</td>
<td>Sofa</td>
<td>22/02/02</td>
<td>30000</td>
</tr>
<tr>
<td>9</td>
<td>Park sitting</td>
<td>Sofa</td>
<td>13/12/01</td>
<td>9000</td>
</tr>
<tr>
<td>10</td>
<td>Dine Paradise</td>
<td>Dining Table</td>
<td>19/02/02</td>
<td>11000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table: NEWONES</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>ITEMNAME</td>
<td>TYPE</td>
<td>DATEOFSTOCKS</td>
<td>PRICE</td>
</tr>
<tr>
<td>11</td>
<td>White wood</td>
<td>Double bed</td>
<td>23/03/03</td>
<td>20000</td>
</tr>
<tr>
<td>12</td>
<td>James 007</td>
<td>Sofa</td>
<td>20/02/03</td>
<td>15000</td>
</tr>
<tr>
<td>13</td>
<td>Tom look</td>
<td>Baby cot</td>
<td>21/02/13</td>
<td>7000</td>
</tr>
</tbody>
</table>

(a) To show all information about the sofas from the INTERIORS table.
(b) To list the ITEMNAME which are priced at more than 10,000 from the INTERIORS table.
(c) To list ITEMNAME and TYPE of those items, in which DATEOFSTOCK is before 22/01/02 from the INTERIERS table in the descending order of ITEMNAME.
(d) To display ITEMNAME and DATEOFSTOCK of those items, in which the discount Percentage is more than 15 from INTERIORS table.
(e) To count the number of items, whose type is “Double Bed” from INTERIOR table.

4. Write SQL command for (a) to (e) on the bases of tables FURNITURE AND ARRIVALS.

<table>
<thead>
<tr>
<th>Table: FURNITURE</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NO .</td>
<td>ITEMNAME</td>
<td>TYPE</td>
<td>DATEOFSTOCK</td>
<td>PRICE</td>
</tr>
<tr>
<td>1</td>
<td>White lotus</td>
<td>Double Bed</td>
<td>23/02/02</td>
<td>30000</td>
</tr>
<tr>
<td>2</td>
<td>Pink feather</td>
<td>Baby cot</td>
<td>20/01/02</td>
<td>7000</td>
</tr>
<tr>
<td>3</td>
<td>Dolphin</td>
<td>Baby cot</td>
<td>19/02/02</td>
<td>9500</td>
</tr>
<tr>
<td>4</td>
<td>Decent</td>
<td>Office Table</td>
<td>01/01/02</td>
<td>25000</td>
</tr>
<tr>
<td>5</td>
<td>Comfort zone</td>
<td>Double Bed</td>
<td>12/01/02</td>
<td>25000</td>
</tr>
<tr>
<td>6</td>
<td>Donald</td>
<td>Baby cot</td>
<td>24/02/02</td>
<td>6500</td>
</tr>
<tr>
<td>7</td>
<td>Royal Finish</td>
<td>Office Table</td>
<td>20/02/02</td>
<td>18000</td>
</tr>
<tr>
<td>8</td>
<td>Royal tiger</td>
<td>Sofa</td>
<td>22/02/02</td>
<td>31000</td>
</tr>
<tr>
<td>9</td>
<td>Econo sitting</td>
<td>Sofa</td>
<td>13/12/01</td>
<td>9500</td>
</tr>
<tr>
<td>10</td>
<td>Eating paradise</td>
<td>Dining Table</td>
<td>19/02/02</td>
<td>11500</td>
</tr>
</tbody>
</table>
Table: ARRIVALS

<table>
<thead>
<tr>
<th>NO.</th>
<th>ITEMNAME</th>
<th>TYPE</th>
<th>DATEOFSTOC</th>
<th>PRICE</th>
<th>DISCOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Wood Comfort</td>
<td>Double Bed</td>
<td>23/03/03</td>
<td>25000</td>
<td>25</td>
</tr>
<tr>
<td>12</td>
<td>Old Fox</td>
<td>Sofa</td>
<td>20/02/03</td>
<td>17000</td>
<td>20</td>
</tr>
<tr>
<td>13</td>
<td>Micky</td>
<td>Baby cot</td>
<td>21/02/02</td>
<td>7500</td>
<td>15</td>
</tr>
</tbody>
</table>

(a) To show all information about the baby cots from the FURNITURE table.
(b) To list the ITEMNAME which are priced at more than 15000 from the FURNITURE table.
(c) To list ITEMNAME AND TYPE of those items, in which DATEOFSTOCK is before 22/01/02 from the FURNITURE table in descending order of ITEMNAME.
(d) To display ITEMNAME and DATEOFSTOCK of those items, in which the DISCOUNT percentage is more than 25 from the FURNITURE table.
(e) To insert a new row in the ARRIVALS table with the following data: 14, “Velvet touch”, Double bed”, 25/03/03, 25000, 30

5. Write SQL commands for (a) to (e) on the basis of the Teacher relation given below:

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Age</th>
<th>Department</th>
<th>Date of join</th>
<th>Salary</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Jugal</td>
<td>34</td>
<td>Computer</td>
<td>10/01/97</td>
<td>12000</td>
<td>M</td>
</tr>
<tr>
<td>2.</td>
<td>Sharmila</td>
<td>31</td>
<td>History</td>
<td>24/03/98</td>
<td>20000</td>
<td>F</td>
</tr>
<tr>
<td>3.</td>
<td>Sandeep</td>
<td>32</td>
<td>Maths</td>
<td>12/12/96</td>
<td>30000</td>
<td>M</td>
</tr>
<tr>
<td>4.</td>
<td>Sangeeta</td>
<td>35</td>
<td>History</td>
<td>01/07/99</td>
<td>40000</td>
<td>F</td>
</tr>
<tr>
<td>5.</td>
<td>Rakesh</td>
<td>42</td>
<td>Maths</td>
<td>05/09/97</td>
<td>25000</td>
<td>M</td>
</tr>
<tr>
<td>6.</td>
<td>Shyam</td>
<td>50</td>
<td>History</td>
<td>27/06/98</td>
<td>30000</td>
<td>M</td>
</tr>
<tr>
<td>7.</td>
<td>Shiv Om</td>
<td>44</td>
<td>Computer</td>
<td>25/02/97</td>
<td>21000</td>
<td>M</td>
</tr>
<tr>
<td>8.</td>
<td>Shalakha</td>
<td>33</td>
<td>Maths</td>
<td>31/07/97</td>
<td>20000</td>
<td>F</td>
</tr>
</tbody>
</table>

(a) To show all information about the teacher of the history department
(b) To list the names of female teachers who are in the Hindi department
(c) To list names of all teachers with their date of joining in ascending order.
(d) To display teacher’s Name, Salary, Age for male teacher only
(e) To count the number of teachers with Age>23.

6. Answer the questions (i) and (v) on the basis of the following tables SHOP and ACCESSORIES.
TABLE ACCESSORIES

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Price</th>
<th>ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>A01</td>
<td>Mother Board</td>
<td>12000</td>
<td>S01</td>
</tr>
<tr>
<td>A02</td>
<td>Hard Disk</td>
<td>5000</td>
<td>S01</td>
</tr>
<tr>
<td>A03</td>
<td>Keyboard</td>
<td>500</td>
<td>S02</td>
</tr>
<tr>
<td>A04</td>
<td>Mouse</td>
<td>300</td>
<td>S01</td>
</tr>
<tr>
<td>A05</td>
<td>Mother Board</td>
<td>13000</td>
<td>S02</td>
</tr>
<tr>
<td>A06</td>
<td>Keyboard</td>
<td>400</td>
<td>S03</td>
</tr>
<tr>
<td>A07</td>
<td>LCD</td>
<td>6000</td>
<td>S04</td>
</tr>
<tr>
<td>T08</td>
<td>LCD</td>
<td>5500</td>
<td>S05</td>
</tr>
<tr>
<td>T09</td>
<td>Mouse</td>
<td>350</td>
<td>S05</td>
</tr>
<tr>
<td>T10</td>
<td>Hard Disk</td>
<td>4500</td>
<td>S03</td>
</tr>
</tbody>
</table>

Write the SQL queries:

(i) To display Name and Price of all the accessories in ascending order of their Price.
(ii) To display Id and SName of all Shop in Nehru Place.
(iii) To display Minimum and Maximum Price of each Name of accessories.
(iv) To display Name, Price of all accessories and their respective SName where they are available.
(v) To display all Sname in descending order.

7. Consider the following table GARMENT and FABRIC, Write SQL commands for the statements (i) to (v)

TABLE GARMENT

<table>
<thead>
<tr>
<th>GCODE</th>
<th>DESCRIPTION</th>
<th>PRICE</th>
<th>FCODE</th>
<th>READYDATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>10023</td>
<td>PENCIL SKIRT</td>
<td>1150</td>
<td>F 03</td>
<td>19-DEC-08</td>
</tr>
<tr>
<td>10001</td>
<td>FORMAL SHIRT</td>
<td>1250</td>
<td>F 01</td>
<td>12-JAN-08</td>
</tr>
<tr>
<td>10012</td>
<td>INFORMAL SHIRT</td>
<td>1550</td>
<td>F 02</td>
<td>06-JUN-08</td>
</tr>
<tr>
<td>10024</td>
<td>BABY TOP</td>
<td>750</td>
<td>F 03</td>
<td>07-APR-07</td>
</tr>
<tr>
<td>10090</td>
<td>TULIP SKIRT</td>
<td>850</td>
<td>F 02</td>
<td>31-MAR-07</td>
</tr>
<tr>
<td>10019</td>
<td>EVENING GOWN</td>
<td>850</td>
<td>F 03</td>
<td>06-JUN-08</td>
</tr>
<tr>
<td>10009</td>
<td>INFORMAL PANT</td>
<td>1500</td>
<td>F 02</td>
<td>20-OCT-08</td>
</tr>
<tr>
<td>10007</td>
<td>FORMAL PANT</td>
<td>1350</td>
<td>F 01</td>
<td>09-MAR-08</td>
</tr>
<tr>
<td>10020</td>
<td>FROCK</td>
<td>85</td>
<td>F 04</td>
<td>09-SEP-07</td>
</tr>
<tr>
<td>10089</td>
<td>SLACKS</td>
<td>750</td>
<td>F 03</td>
<td>20-OCT-08</td>
</tr>
</tbody>
</table>

TABLE FABRIC

<table>
<thead>
<tr>
<th>FCODE</th>
<th>TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>F 04</td>
<td>POLYSTER</td>
</tr>
<tr>
<td>F 02</td>
<td>COTTON</td>
</tr>
<tr>
<td>F 03</td>
<td>SILK</td>
</tr>
<tr>
<td>F01</td>
<td>TERELENE</td>
</tr>
</tbody>
</table>

(i) To display GCODE and DESCRIPTION of each GARMENT in descending order of GCODE.
(ii) To display the details of all the GARMENT, which have READYDATE in between 08-DEC-07 and 16-JUN-08 (inclusive if both the dates).
(iii) To display the average PRICE of all the GARMENT, which are made up of fabric with FCODE asF03.
(iv) To display fabric wise highest and lowest price of GARMENT from GARMENT table. (DisplayFCODE of each GARMENT along with highest and lowest Price).
(v) To display Gcode whose Price is more than 1000.
ANSWERS:
CASE STUDY BASED QUESTIONS

1. (a) Select Name From GRADUATE Where DIV = 1 Order by Name;
(b) Select Name, stipend, subject, stepend *12 From GRADUATE
(c) Select count (*) From GRADUATE
   Where subject IN (“PHYSICS”, “COMPUTER SC”);
(d) Insert into GRADUATE Values (11, “KAJOL”, 300, “COMPUTER SC”, 75,1);
(e) Select name from Graduate where average>65

2. (a) Select * From CLUB Where sports = “SWIMMING”;
(b) Select COACHNAME From CLUB order by DATOFAPP desc
(c) Select coachname, pay, age, 0.15 * pay From CLUB;
(d) Insert into CLUB Values (11, “PRAKASH”, 37, “SQUASH”, [25/02/98], 2500, “M”);
(e) Select Coachname ,Sports,Pay from Club .

3 (a) Select * From INTERIORS Where TYPE = “Sofa”;
(b) Select ITEMNAME From INTERIORS Where PRICE > 10000;
(c) Select ITEMNAME, TYPE From INTERIORS
   Where DATEOFSTOCK < {22/01/02} Order by ITEMNAME desc;
(d) Select ITEMNAME, DATEOFSTOCK From INTERIORS Where DISCOUNT > 15;
(e) Select Count (*) From INFERIORS Where TYPE = “Double Bed”;

4 (a) Select * From FURNITURE Where TYPE = “Baby cot”;
(b) Select ITEMNAME From FURNITURE Where PRICE > 15000;
(c) Select ITEMNAME, TYPE From FURNITURE
   Where DATEOFSTOCK < {22/01/02} Order by ITEMNAME desc;
(d) Select ITEMNAME, DATEOFSTOCK From FURNITURE Where DISCOUNT > 25.
(e) Insert Into ARRIVALS Values (14, “Velvet touch”, “Double bed”,
{25/03/03}, 25000, 30);

5 (a) SELECT * FROM Teacher WHERE Department = “History”;
(b) SELECT Name FROM Teacher WHERE Department = “Hindi” and Sex = “F”;
(c) SELECT Name, Dateofjoin FROM Teacher ORDER BY Dateofjoin;
(d) SELECT Name, Salary, Age FROM Teacher
   WHERE Age > 23 AND Sex = ‘M’;
(e) SELECT COUNT (*) FROM Teacher WHERE Age > 23;

6. (i) SELECT Name, Price FROM ACCESSORIES ORDER BY Price ASC;
(ii) SELECT ID, Price FROM SHOP
    WHERE Area = ‘Nehru Place’;
(iii) SELECT MIN (Price) “Minimum Price”, MAX (Price) “Maximum Price”;
    Name FROM ACCESSORIES GROUP BY Name;
(iv) SELECT Name, Price, SName
    FROM ACCESSORIES A, SHOP S WHERE A. ID = S. ID
(v) SELECT Sname from Shop order by SName desc;
7. (i) SELECT GCODE, DESCRIPTION FROM GARMENT ORDER BY GCODE DESC;
(ii) SELECT * FROM GARMENT WHERE READY DATE BETWEEN '08-DEC-07' AND '16-JUN-08';
(iii) SELECT AVG (PRICE) FROM GARMENT WHERE FCODE = ‘F03’;
(iv) SELECT FCODE, MAX (PRICE), MIN (PRICE) FROM GARMENT GROUP BY FCODE;
(v) Select Gcode from GARMENT where Price>1000;
Class: XII Session 2021-22
Computer Science (083)
TERM – 2 Question Paper (Theory)
Unit-wise mark distribution pattern

<table>
<thead>
<tr>
<th>Unit</th>
<th>MCQ</th>
<th>Short Answer</th>
<th>Long Answer</th>
<th>Case study</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit -1</td>
<td>2 (2 Q)</td>
<td>-</td>
<td>3 (1 Q)</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Unit -2</td>
<td>2 (2 Q)</td>
<td>4 (2 Q)</td>
<td>-</td>
<td>4 (1 Q)</td>
<td>10</td>
</tr>
<tr>
<td>Unit - 3</td>
<td>1 (1 Q)</td>
<td>6 (3 Q)</td>
<td>9 (3 Q)</td>
<td>4 (1 Q)</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>10</td>
<td>12</td>
<td>8</td>
<td>35</td>
</tr>
</tbody>
</table>
KENDRIYA VIDYALAYA SANGATHAN, RAIPUR REGION
TERM - 2 EXAMINATION SET-1 – 2021-22

Class – XII
Max. Marks: 35

SUB-Computer Sc.
Duration: 2:00Hrs

General Instructions:
5. This question paper contains two parts A and B. Each part is compulsory.
6. Some questions have internal choice.
7. Part-A has 8 MCQ questions of 1 mark each. Attempts any 5 questions.
8. Part – B has three sections
   a. Section-I is short answer questions of 2 marks each.
   b. Section-II is long answer questions of 3 marks each.
   c. Section-III is very long answer questions of 4 marks.
9. All programming questions are to be answered using Python Language only.

<table>
<thead>
<tr>
<th>Question No.</th>
<th>PART – A</th>
<th>Marks Allocated</th>
</tr>
</thead>
</table>
| 1 | If a user tries to remove an element from empty Stack, it is called-  
   a) Empty Collection   
   b)Overflow   
   c)Underflow   
   d)Garbage Collection | 1 |
| 2 | Which of the following is application of Stack?  
   a)One Way Traffic  
   b)A line of ticket seeking people  
   c)Reversing the order of items  
   d)Printer shared among four computers | 1 |
| 3 | Consider the following operation performed on a stack of size 5.  
   Push(1); Pop();Push(2);Push(3); Pop(); Push(4);Pop();Pop();Push(5);  
   After the completion of all operation, the number of elements present in stack are:  
   a)1  
   b)2  
   c)3  
   d)4 | 1 |
| 4 | Network in which every computer is capable of playing the role of a client, or a server or both at same time is called-  
   a)local area network  
   b)peer-to-peer network  
   c)dedicated server network  
   d)wide area network | 1 |
| 5 | In computer, converting a digital signal in to an analog signal is called-  
   a)modulation  
   b)demodulation  
   c)conversion  
   d)transformation | 1 |
| 6 | Which of the following keywords will you use in the following query to display the unique values of the column dept_name?  
   a)all  
   b)from  
   c)distinct  
   d)unique | 1 |
| 7 | The pattern ‘_ _ _’ matches any string of three characters. ‘_ _ _%’ matches and string of three characters.  
   a)Atleast, Exactly  
   b)Exactly, Atleast  
   c)Atleast, All  
   d)All, Exactly | 1 |
| 8 | All aggregate functions except ignoring null values in their input collection.  
   a)count(attribute)  
   b)count(*)  
   c)avg  
   d)none of these | 1 |

**Part B**

**SECTION - 1**

9. Expand the following-  
i SMTP:  
ii DHCP:  
iii HTTP:  
iv TCP:  
10. Define Web-Hosting?  

**OR**

Give difference between Video Conferencing and Chat.  
Give difference between CHAR and VARCHAR. Give Example.  
What do you understand by the terms Candidate Key? What is Cardinality?  
The SQL SELECT provides clauses for sorting data and for grouping results. Write the names of clauses for these.

**SECTION - 2**

14. Each node of a Stack contains the following information: PINCODE and NAME of city.  
Write a PUSHCITY() function to implement push on stack like operation to add a node to Stack.
Write a POPCITY() function to implement pop from stack like operation to remove a node(same as above) from Stack.

A department is considering to maintain their worker data using SQL to store the data. As a Database Administrator, Karan has decided that:

Name of the database – Department
Name of the table – Worker

The attributes of Worker are as follows:
WORKER_ID – CHARACTER OF SIZE 3
FIRST_NAME – CHARACTER OF SIZE 10
LAST_NAME – CHARACTER OF SIZE 10
SALARY – NUMERIC
JOINING_DATE – DATE

<table>
<thead>
<tr>
<th>WORKER_ID</th>
<th>FIRST_NAME</th>
<th>LAST_NAME</th>
<th>SALARY</th>
<th>JOINING_DATE</th>
<th>DEPARTMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>MONIKA</td>
<td>ARORA</td>
<td>100000</td>
<td>2014-02-20</td>
<td>HR</td>
</tr>
<tr>
<td>002</td>
<td>NIHARIKA</td>
<td>DIWAN</td>
<td>80000</td>
<td>2014-06-11</td>
<td>Admin</td>
</tr>
<tr>
<td>003</td>
<td>VISHAL</td>
<td>SINGHAL</td>
<td>300000</td>
<td>2014-02-20</td>
<td>HR</td>
</tr>
<tr>
<td>004</td>
<td>AMITABHI</td>
<td>SINGH</td>
<td>500000</td>
<td>2014-02-20</td>
<td>Admin</td>
</tr>
<tr>
<td>005</td>
<td>VIVEK</td>
<td>BHATI</td>
<td>500000</td>
<td>2014-06-11</td>
<td>Admin</td>
</tr>
<tr>
<td>006</td>
<td>VIPUL</td>
<td>DIWAN</td>
<td>200000</td>
<td>2014-06-11</td>
<td>Account</td>
</tr>
<tr>
<td>007</td>
<td>SATISH</td>
<td>KUMAR</td>
<td>75000</td>
<td>2014-02-20</td>
<td>Account</td>
</tr>
<tr>
<td>008</td>
<td>MONIKA</td>
<td>CHAUHAN</td>
<td>80000</td>
<td>2014-04-11</td>
<td>Admin</td>
</tr>
</tbody>
</table>

Karan wants to remove all the data from table WORKER from the database department. Which command will he use from the following:

a) DELETE FROM WORKER;
b) DROP TABLE WORKER;
c) DROP DATABASE Department;
d) DELETE * FROM WORKER;

Identify the attribute best suitable to be declared as a primary key.

Karan wants to increase the size of the FIRST_NAME column from 10 to 20 characters. Write an appropriate query to change the size.

Write a query to display the structure of the table Worker, i.e. name of the attribute and their respective data types.

Write the output of the SQL queries (i) to (iii) based on the table: Employee

<table>
<thead>
<tr>
<th>ECODE</th>
<th>NAME</th>
<th>DEPT</th>
<th>DOB</th>
<th>GENDER</th>
<th>DESIGNATION</th>
<th>SALARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>SUNITA</td>
<td>SALES</td>
<td>06-06-1995</td>
<td>F</td>
<td>MANAGER</td>
<td>25000</td>
</tr>
<tr>
<td>102</td>
<td>NEERU</td>
<td>OFFICE</td>
<td>05-07-1993</td>
<td>F</td>
<td>CLERK</td>
<td>12000</td>
</tr>
<tr>
<td>103</td>
<td>RAJU</td>
<td>PURCHAS E</td>
<td>05-06-1994</td>
<td>M</td>
<td>MANAGER</td>
<td>26000</td>
</tr>
<tr>
<td>104</td>
<td>NEHA</td>
<td>OFFICE</td>
<td>08-08-1995</td>
<td>F</td>
<td>ACCOUNTANT</td>
<td>18000</td>
</tr>
<tr>
<td>105</td>
<td>NISHAN T</td>
<td>OFFICE</td>
<td>08-10-1995</td>
<td>M</td>
<td>CLERK</td>
<td>10000</td>
</tr>
<tr>
<td>106</td>
<td>VINOD</td>
<td>OFFICE</td>
<td>12-12-1994</td>
<td>M</td>
<td>CLERK</td>
<td>10000</td>
</tr>
</tbody>
</table>

SELECT SUM(SALARY) FROM EMPLOYEE WHERE GENDER='F' AND DEPT = 'SALES';

SELECT MAX(DOB), MIN(DOB) FROM EMPLOYEE;

SELECT GENDER, COUNT(*) FROM EMPLOYEE GROUP BY GENDER;
Consider the table TEACHER given below. Write commands in SQL for (i) to (iii)

<table>
<thead>
<tr>
<th>ID</th>
<th>NAME</th>
<th>DEPARTMENT</th>
<th>HIREDATE</th>
<th>CATEGORY</th>
<th>GENDER</th>
<th>SALARY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TANIYA</td>
<td>SOCIALSTUDIES</td>
<td>1994-03-17</td>
<td>TGT</td>
<td>F</td>
<td>25000</td>
</tr>
<tr>
<td>2</td>
<td>ABHISHEK</td>
<td>ART</td>
<td>1990-12-02</td>
<td>PRT</td>
<td>M</td>
<td>20000</td>
</tr>
<tr>
<td>3</td>
<td>SANJANA</td>
<td>ENGLISH</td>
<td>1980-05-16</td>
<td>PGT</td>
<td>F</td>
<td>30000</td>
</tr>
<tr>
<td>4</td>
<td>VISHWAJEE</td>
<td>ENGLISH</td>
<td>1989-10-16</td>
<td>TGT</td>
<td>M</td>
<td>25000</td>
</tr>
<tr>
<td>5</td>
<td>AMAN</td>
<td>HINDI</td>
<td>1990-01-08</td>
<td>PRT</td>
<td>F</td>
<td>22000</td>
</tr>
<tr>
<td>6</td>
<td>PRITAM</td>
<td>MATH</td>
<td>1980-03-17</td>
<td>PRT</td>
<td>M</td>
<td>21000</td>
</tr>
<tr>
<td>7</td>
<td>RAJKUMAR</td>
<td>SCIENCE</td>
<td>1994-02-09</td>
<td>TGT</td>
<td>M</td>
<td>27000</td>
</tr>
<tr>
<td>8</td>
<td>SITAL</td>
<td>MATH</td>
<td>1980-11-17</td>
<td>TGT</td>
<td>F</td>
<td>24500</td>
</tr>
</tbody>
</table>

Attempt the following -

i. To display all information about teachers of Female PGT Teachers.

ii. To list names, departments and date of hiring of all the teachers in descending order of date of joining.

iii. To count the number of teachers and sum of their salary department wise.

SECTION - 3

Success Institution is an educational organisation. It is planning to set up its India campus at Nepal with its head office at Mumbai. The Nepal campus has 4 main buildings- ADMIN, ENGINEERING, BUSINESS and MEDIA.

You as a network expert have to suggest the best network related solutions for their problems raised in (i) to (iv), keeping in mind the distance between the buildings and other given parameters.

<table>
<thead>
<tr>
<th>ADMIN</th>
<th>ENGINEERING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BUSINESS</th>
<th>MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Shortest distance between various buildings
ADMIN to ENGINEERING 50 M
ADMIN to BUSINESS 80 M
ADMIN to MEDIA 45 M
ENGINEERING to BUSINESS 60 M
ENGINEERING to MEDIA 145 M
BUSINESS to MEDIA 50 M
Mumbai Head Office To Nepal Campus 2175 KM

Number of Computers installed at various buildings are as follows:

<table>
<thead>
<tr>
<th>ADMIN</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGINEERING</td>
<td>150</td>
</tr>
<tr>
<td>BUSINESS</td>
<td>35</td>
</tr>
<tr>
<td>MUMBAI HEAD OFFICE</td>
<td>05</td>
</tr>
</tbody>
</table>

i. Suggest the most appropriate location of the server inside the Nepal Campus(out of 4 buildings), to get the best connectivity for maximum number of computers. Justify your answer.

ii. Suggest and draw the cable layout to efficiently connect various buildings within the Nepal Campus for connecting the computers.

iii. Which hardware device will you suggest to be procured by the company to be installed to protect and control the Internet usage within the campus.

iv. Which of the following will you suggest to establish the online face-to-face communication between the people in the ADMIN office of Nepal Campus and Mumbai Head Office?
   a) Cable TV  b) E-Mail  c) Video Conferencing  d) Text Chat

Consider the tables Watches and Sale given below and answer the following questions.

Watches

<table>
<thead>
<tr>
<th>Watchid</th>
<th>Watch_Name</th>
<th>Price</th>
<th>Type</th>
<th>Qty_Store</th>
</tr>
</thead>
<tbody>
<tr>
<td>W001</td>
<td>High Time</td>
<td>10000</td>
<td>Unisex</td>
<td>100</td>
</tr>
<tr>
<td>W002</td>
<td>Life Time</td>
<td>15000</td>
<td>Ladies</td>
<td>150</td>
</tr>
<tr>
<td>W003</td>
<td>Wave</td>
<td>20000</td>
<td>Gents</td>
<td>200</td>
</tr>
<tr>
<td>W004</td>
<td>High Fashion</td>
<td>7000</td>
<td>Unisex</td>
<td>250</td>
</tr>
<tr>
<td>W005</td>
<td>Golden Time</td>
<td>25000</td>
<td>Gents</td>
<td>100</td>
</tr>
<tr>
<td>Watchid</td>
<td>Qty_Sold</td>
<td>Quarter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>----------</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W001</td>
<td>10</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W003</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W002</td>
<td>20</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W003</td>
<td>10</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W001</td>
<td>15</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W002</td>
<td>20</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W005</td>
<td>10</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W003</td>
<td>15</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Write the SQL command for the following statements:

i  To display total quantity in store of unisex type watches.

ii To display watch name and their quantity sold in first quarter.

Give the output for the following SQL queries:

i  SELECT WATCH_NAME, PRICE, TYPE FROM WATCHES W, SALE S WHERE W.WATCHID=S.WATCHID;

ii SELECT WATCH_NAME, QTY_STORE, SUM(QTY_SOLD), FROM WATCHES W, SALE S WHERE W.WATCHID = S.WATCHID GROUP BY S.WATCHID
## MARKING SCHEME

### Class – XII SUB-Computer Sc.

<table>
<thead>
<tr>
<th>Question No.</th>
<th>PART - A</th>
<th>Marks Allotted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Section -1</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>C) UNDERFLOW</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>C) Reversing the order of items</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>a) i</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>b) peer-to-peer network</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>a) modulation</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>c) distinct</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>b) Exactly, Atleast</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>a) count(attribute)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Part B</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Expand the following-</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>i SIMPLE MAIL TRANSFER PROTOCOL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii DYNAMIC HOST CONFIGURATION PROTOCOL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii HYPERTEXT TRANSFER PROTOCOL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iv TRANSMISSION CONTROL PROTOCOL</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>When a hosting provider allocates space on a web server for a website to store its files, they are hosting a website.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Video Conferencing</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Audio as well Visuals are shared</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>High Bandwidth required</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Works with low bandwidth also.</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>CHAR is used to occupy fixed memory irrespective of the actual values but VARCHAR uses only that much memory which is used actually for the entered values. E.g. CHAR(10) will occupy always 10 bytes in memory no matter how many characters are used in values. But VARCHAR will uses only that much bytes of memory whose values are passed.</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>CANDIDATE KEY</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>A Candidate key is the one that is capable of becoming primary key.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CARDINALITY OF A RELATION</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cardinality of a relation represents number of rows in the relation.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>ORDER BY for sorting</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>GROUP BY for grouping data</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>city=[]</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>def PUSHCITY(cityname,pincode):</td>
<td></td>
</tr>
<tr>
<td></td>
<td>city.insert(0,[cityname,pincode])</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>city=[]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>def POPCITY():</td>
<td></td>
</tr>
<tr>
<td></td>
<td>if len(city)==0:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>print(“Underflow”)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>return None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>return city.pop()</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td><strong>ANSWER</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>i d) DELETE * FROM WORKER;</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>ii WORKER_ID</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>iii ALTER TABLE WORKER MODIFY FIRST_NAME VARCHAR(20)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>iv DESC WORKER/DESCRIBE WORKER;</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td><strong>ANSWER</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>i 43000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii MAX(DOB) MIN(DOB)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>08-10-1995 05-07-1993</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iii GENDER COUNT(*)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M 3</td>
<td></td>
</tr>
</tbody>
</table>
17

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>SELECT * FROM TEACHER WHERE GENDER='F' AND CATEGORY='PGT';</td>
</tr>
<tr>
<td>ii</td>
<td>SELECT NAME, DEPARTMENT AND HIREDATE FROM TEACHER ORDER BY HIREDATE DESC;</td>
</tr>
<tr>
<td>iii</td>
<td>SELECT COUNT(*), SUM(SALARY) FROM TEACHER GROUP BY DEPARTMENT;</td>
</tr>
</tbody>
</table>

18

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>ENGINEERING block because it has max number of computers.</td>
</tr>
<tr>
<td>ii</td>
<td></td>
</tr>
</tbody>
</table>

19

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>SELECT SUM(QTY_STORE) FROM WATCHES WHERE TYPE = 'Unisex';</td>
</tr>
<tr>
<td>ii</td>
<td>SELECT WATCH_NAME, QTY_SOLD FROM WATCHES W, SALE S WHERE S.WATCHID=S.WATCHID AND QUARTER=1;</td>
</tr>
<tr>
<td>iii</td>
<td>HIGH TIME 100000</td>
</tr>
<tr>
<td></td>
<td>LIFE TIME 15000</td>
</tr>
<tr>
<td></td>
<td>WAVE 20000</td>
</tr>
<tr>
<td></td>
<td>HIGH FASHION 7000</td>
</tr>
<tr>
<td></td>
<td>GOLDEN TIME 25000</td>
</tr>
<tr>
<td>iv</td>
<td>HIGH TIME 100</td>
</tr>
<tr>
<td></td>
<td>LIFE TIME 150</td>
</tr>
<tr>
<td></td>
<td>WAVE 200</td>
</tr>
<tr>
<td></td>
<td>GOLDEN TIME 100</td>
</tr>
</tbody>
</table>
**KENDRIYA VIDYALAYA SANGATHAN, RAIPUR REGION**  
**TERM 2 EXAMINATION SET-2 2021-22**

**Class – XII**  
**Max. Marks: 35**  
**SUB-Computer Sc.**  
**Duration: 2:00Hrs**

**General Instructions:**
1. This question paper contains two parts A and B. Each part is compulsory.
2. Some questions have internal choice.
3. Part-A has 8 MCQ questions of 1 mark each, Attempts any 5 questions.
4. Part – B has three sections  
   a. Section-I is short answer questions of 2 marks each.
   b. Section-II is long answer questions of 3 marks each.
   c. Section-III is very long answer questions of 4 marks each.
5. All programming questions are to be answered using Python Language only.

<table>
<thead>
<tr>
<th>Question No.</th>
<th>PART – A</th>
<th>Marks Allotted</th>
</tr>
</thead>
</table>
| 1 | What is the value of the postfix expression 6 3 2 4 + - *  
a)1 b)40 c)74 d) -18 | 1 |
| 2 | The insertion operation in the stack is called__________.  
a)insert b)push c)pop d)top | 1 |
| 3 | The length of an IP address is:  
a)8 bits b)16 bits c)32 bits d)48 bits | 1 |
| 4 | Mechanism to protect private networks from outside attack is-  
a)Firewall b)Antivirus c)Digital Signature d)Formatting | 1 |
| 5 | Every network interface card(NIC) comes with its own__________address.  
a) IP Address b)DHCP Address c) Physical Address(MAC) d) OSI | 1 |
| 6 | A table has 4 columns and 6 rows. What is its cardinality?  
a)4 b)6 c)24 d)10 | 1 |
| 7 | Which one is not DML?  
a)Alter b)Delete c)Update d)Select | 1 |
| 8 | The data types CHAR(n) and VARCHAR(n) are used to create__________, and__________types of  
string/text fields in a database.  
a)Fixed, equal b)Equal, variable c)Fixed, Variable d)Variable, equal | 1 |

**Part B**  
**SECTION - 1**

9. Expand the following-  
i) GSM:  
ii) POP:  
iii) FTP:  
iv) XML:  
10. Define Web-Server?  

**OR**

Give difference between HUB and SWITCH.  
11. Give difference between DDL and DML. Give Example too.  
12. What do you understand by the terms Primary Key? What is Degree of a Relation?  
13. In SQL which command is used to modify the table and which one is used to modify the existing data in a table/relatin?  

**SECTION - 2**

14. Write a function in Python PushBook(Book) to add a new book entry as book_no and book_title in the list of Books, considering it to act as push operations of the Stack data structure.  

**OR**

Write a function in Python PopBook(Book), where Book is a stack implemented by a list of books. The function returns the value deleted from the stack.
Write the outputs of the SQL Queries(i) to (iii) based on the relations Client and Product given below:

<table>
<thead>
<tr>
<th>C_ID</th>
<th>ClientName</th>
<th>City</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Cosmetic Shop</td>
<td>Delhi</td>
<td>2000</td>
</tr>
<tr>
<td>02</td>
<td>Total Health</td>
<td>Mumbai</td>
<td>3500</td>
</tr>
<tr>
<td>03</td>
<td>Live Life</td>
<td>Delhi</td>
<td>4500</td>
</tr>
<tr>
<td>04</td>
<td>Pretty Woman</td>
<td>Delhi</td>
<td>2500</td>
</tr>
<tr>
<td>05</td>
<td>Dreams</td>
<td>Delhi</td>
<td>NULL</td>
</tr>
</tbody>
</table>

Attempt any 03 of the following :-

i  SELECT COUNT(CITY),CITY FROM CLIENT GROUP BY CITY;

ii SELECT CLIENTNAME FROM CLIENT WHERE CLIENTNAME LIKE '%C%';

iii SELECT AVG(SHARE) FROM CLIENT WHERE CITY='DELHI';

iv SELECT CLIENTNAME FROM CLIENT ORDER BY SHARE DESC;

Consider the following table GARMENT. Write SQL commands for the following statements.

<table>
<thead>
<tr>
<th>GCODE</th>
<th>DESCRIPTION</th>
<th>PRICE</th>
<th>FCODE</th>
<th>READYDATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>10023</td>
<td>SKIRT</td>
<td>1150</td>
<td>F03</td>
<td>19-DEC-08</td>
</tr>
<tr>
<td>10001</td>
<td>FORMAL SHIRT</td>
<td>1250</td>
<td>F01</td>
<td>12-JAN-08</td>
</tr>
<tr>
<td>10012</td>
<td>INFORMAL SHIRT</td>
<td>1550</td>
<td>F02</td>
<td>06-JUN-08</td>
</tr>
<tr>
<td>10024</td>
<td>BABY TOP</td>
<td>750</td>
<td>F03</td>
<td>07-APR-07</td>
</tr>
<tr>
<td>10090</td>
<td>TOP</td>
<td>850</td>
<td>F02</td>
<td>31-MAR-07</td>
</tr>
<tr>
<td>10019</td>
<td>EVENING DRESS</td>
<td>850</td>
<td>F03</td>
<td>06-JUN-08</td>
</tr>
<tr>
<td>10009</td>
<td>INFORMAL PANT</td>
<td>1500</td>
<td>F02</td>
<td>20-OCT-08</td>
</tr>
<tr>
<td>10017</td>
<td>FORMAL PANT</td>
<td>1350</td>
<td>F01</td>
<td>09-MAR-08</td>
</tr>
<tr>
<td>10020</td>
<td>FROCK</td>
<td>850</td>
<td>F04</td>
<td>09-SEP-07</td>
</tr>
<tr>
<td>10089</td>
<td>SLACKS</td>
<td>750</td>
<td>F03</td>
<td>31-OCT-08</td>
</tr>
</tbody>
</table>

i To Display GCODE and DESCRIPTION of each GARMENT in descending order of GCODE.

ii To display the details of all the GARMENTS, which have READYDATE in between 08-DEC-07 and 16-JUN-08(inclusive of both the dates)

iii To display FCODE wise highest and lowest price of GARMENTS from GARMENT table.

Consider the following table HOSPITAL. Write SQL commands for the following statements.

<table>
<thead>
<tr>
<th>NO</th>
<th>NAME</th>
<th>AGE</th>
<th>DEPARTMENT</th>
<th>DATEOFJOIN</th>
<th>CHARGES</th>
<th>GENDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ARPIT</td>
<td>62</td>
<td>SURGERY</td>
<td>21/01/98</td>
<td>300</td>
<td>M</td>
</tr>
<tr>
<td>2</td>
<td>ZARINA</td>
<td>22</td>
<td>ENT</td>
<td>12/12/97</td>
<td>250</td>
<td>F</td>
</tr>
<tr>
<td>3</td>
<td>KAREEM</td>
<td>22</td>
<td>ORTHOPEDIC</td>
<td>19/02/98</td>
<td>200</td>
<td>M</td>
</tr>
<tr>
<td>4</td>
<td>ARUN</td>
<td>12</td>
<td>SURGERY</td>
<td>11/01/98</td>
<td>300</td>
<td>M</td>
</tr>
<tr>
<td>5</td>
<td>ZUBIN</td>
<td>30</td>
<td>ENT</td>
<td>12/01/98</td>
<td>250</td>
<td>M</td>
</tr>
<tr>
<td>6</td>
<td>KETAKI</td>
<td>16</td>
<td>ENT</td>
<td>24/02/98</td>
<td>250</td>
<td>F</td>
</tr>
<tr>
<td>7</td>
<td>ANKITA</td>
<td>29</td>
<td>CARDIOLOGY</td>
<td>20/02/98</td>
<td>800</td>
<td>F</td>
</tr>
<tr>
<td>8</td>
<td>ZAREEN</td>
<td>45</td>
<td>GYNECOLOGY</td>
<td>22/02/98</td>
<td>300</td>
<td>F</td>
</tr>
<tr>
<td>9</td>
<td>KUSH</td>
<td>19</td>
<td>CARDIOLOGY</td>
<td>13/01/98</td>
<td>800</td>
<td>M</td>
</tr>
<tr>
<td>10</td>
<td>SHILPA</td>
<td>23</td>
<td>NUCLEAR MEDICINE</td>
<td>21/02/98</td>
<td>400</td>
<td>F</td>
</tr>
</tbody>
</table>

i SELECT COUNT (DISTINCT Charges) FROM HOSPITAL;

ii SELECT MIN (Age) FROM HOSPITAL WHERE Sex = "F";

iii SELECT SUM (Charges) FROM HOSPITAL WHERE Department = "F";

Quick Learn University is setting up its academic blocks at Prayag Nagar and planning to set up a network. The university has 3 academic blocks and one human resource Centre as shown in the diagram given below:

166 | P a g e
Centre-to-Centre distance between various blocks is as follows:

<table>
<thead>
<tr>
<th>Distance</th>
<th>Law block to business block</th>
<th>Law block to technology block</th>
<th>Law block to HR block</th>
<th>Business block to technology block</th>
<th>Business block to HR block</th>
<th>Technology block to HR block</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40 m</td>
<td>80 m</td>
<td>105 m</td>
<td>30 m</td>
<td>35 m</td>
<td>15 m</td>
</tr>
</tbody>
</table>

Number of computers in each of the buildings is as follows:

<table>
<thead>
<tr>
<th>Building</th>
<th>Computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law block</td>
<td>15</td>
</tr>
<tr>
<td>Technology block</td>
<td>40</td>
</tr>
<tr>
<td>HR Centre</td>
<td>115</td>
</tr>
<tr>
<td>Business block</td>
<td>25</td>
</tr>
</tbody>
</table>

i Suggest the most suitable place to house the server of the organization with suitable reason.

ii Suggest a cable layout of connection between the blocks.

iii Which device should be placed/installed in each of these blocks to efficiently connect all the computers within these blocks?

iv The university is planning to link its sales counters situated in various parts of the other cities. Which type of network out of LAN, MAN or WAN will be formed?

19 Write SQL Commands for the following queries based on the relations PRODUCT and CLIENT given below.

Table: Product

<table>
<thead>
<tr>
<th>P_ID</th>
<th>ProductName</th>
<th>Manufacturer</th>
<th>Price</th>
<th>ExpireDate</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP01</td>
<td>Talcum Powder</td>
<td>LAK</td>
<td>40</td>
<td>2011-06-26</td>
</tr>
<tr>
<td>FW05</td>
<td>Face Wash</td>
<td>ABC</td>
<td>45</td>
<td>2010-12-01</td>
</tr>
<tr>
<td>BS01</td>
<td>Bath Soap</td>
<td>ABC</td>
<td>55</td>
<td>2010-09-10</td>
</tr>
<tr>
<td>SH06</td>
<td>Shampoo</td>
<td>XYZ</td>
<td>120</td>
<td>2012-04-09</td>
</tr>
<tr>
<td>FW12</td>
<td>Face Wash</td>
<td>XYZ</td>
<td>95</td>
<td>2010-08-15</td>
</tr>
</tbody>
</table>

Table: Client

<table>
<thead>
<tr>
<th>C_ID</th>
<th>ClientName</th>
<th>City</th>
<th>P_ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cosmetic Shop</td>
<td>Delhi</td>
<td>FW05</td>
</tr>
<tr>
<td>6</td>
<td>Total Health</td>
<td>Mumbai</td>
<td>BS01</td>
</tr>
<tr>
<td>12</td>
<td>Live Life</td>
<td>Delhi</td>
<td>SH06</td>
</tr>
<tr>
<td>15</td>
<td>Pretty One</td>
<td>Delhi</td>
<td>FW05</td>
</tr>
<tr>
<td>16</td>
<td>Dreams</td>
<td>Bengaluru</td>
<td>TP01</td>
</tr>
<tr>
<td>14</td>
<td>Expressions</td>
<td>Delhi</td>
<td>NULL</td>
</tr>
</tbody>
</table>

i To display the Client Name and City of all Mumbai- and Delhi-based clients in Client table.

ii Increase the price of all the products in Product table by 10%.

iii To display the ProductName, Manufacturer, Expiry Date of all the products that expired on or before ‘2010-12-31’.

iv To display productName, Manufacturer and ClientName of Mumbai City.
<table>
<thead>
<tr>
<th>Question No.</th>
<th>PART - A</th>
<th>Marks Allotted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>d) 18</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>b) push</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>c) 32 bits</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>a) Firewall</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>c) Physical Address(MAC)</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>b) 6</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>a) Alter</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>c) Fixed, Variable</td>
<td>1</td>
</tr>
<tr>
<td>Part B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Expand the following -</td>
<td>2</td>
</tr>
<tr>
<td>i</td>
<td>GSM: GLOBAL SYSTEM FOR MOBILES</td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>POP: POST OFFICE PROTOCOL</td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>FTP: FILE TRANSFER PROTOCOL</td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>XML: EXTENSIBLE MARKUP LANGUAGE</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Web-Server</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>A web server is software and hardware that uses HTTP (Hypertext Transfer Protocol) and other protocols to respond to client requests made over the World Wide Web.</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>Difference between HUB and SWITCH.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>HUB Broadcasts messages.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SWITCH Unicasts messages.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lower Bandwidth</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Higher bandwidth</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Difference between DDL and DML.</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Data Definition Language is used to work on structure of object (tables etc.) while Data Manipulation Language is used to work on data stored in tables.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E.g. DDL create, alter, drop</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DML insert, delete, update</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Primary Key</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>A set of one or more attributes that can uniquely identify tuples within the relation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Degree of a Relation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Degree of a relation represents number of attributes in the relation.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Alter Update</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>def PushBook(Book):</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>bno = input(&quot;enter book no : &quot;)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>btitle = input(&quot;enter book title:&quot;)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rec = bno + &quot; &quot; + btitle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Book.append(rec)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>print(Book)</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>def PopBook(Book):</td>
<td></td>
</tr>
<tr>
<td></td>
<td># If stack is empty</td>
<td></td>
</tr>
<tr>
<td></td>
<td>if len(Book)==0:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>print(&quot;Underflow&quot;)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>else:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>print(&quot;Deleted entry :&quot;, Book.pop())</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>15</td>
<td>Answer</td>
<td></td>
</tr>
</tbody>
</table>
| i | 4 Delhi  
   1 Mumbai | 1 |
| ii | ClientName  
   Cosmetic Shop | 1 |
| iii | `avg(Share)`  
   3000 | 1 |
| iv | Client Name  
   Live Life  
   Total Health  
   Pretty Woman  
   Cosmetic Shop  
   Dreams | 1 |
| 16 | Answer |   |
| i | `SELECT GCODE, DESCRIPTION FROM GARMENT ORDER BY GCODE DESC` |   |
| ii | `SELECT * FROM GARMENT WHERE READYDATE BETWEEN '08-DEC-07' AND '16-JUN-08'`; |   |
| iii | `SELECT FCODE, MAX(PRICE), MIN(PRICE) FROM GARMENT GROUP BY FCODE;` |   |
| 17 | Answer |   |
| i | 5 | 1 |
| ii | 16 | 1 |
| iii | 5 | 1 |
| 18 | Answer |   |
| i | HR CENTRE block because it has max number of computers. | 1 |
| ii | Suggest a cable layout of connection between the blocks. | 1 |
| iii | HUB/SWITCH | 1 |
| iv | WAN | 1 |
| 19 | Answer |   |
| i | `SELECT CLIENTNAME, CITY FROM CLIENT WHERE CITY = 'MUMBAI' OR CITY = 'DELHI';` | 1 |
| ii | `UPDATE PRODUCT SET PRICE = PRICE + 0.10 * PRICE;` | 1 |
| iii | `SELECT PRODUCTNAME, MANUFACTURER, EXPIRYDATE FROM PRODUCT WHERE EXPIRYDATE <= '2010-12-31';` | 1 |
| iv | `select ProductName, Manufacturer, ClientName from product,client WHERE product.P_ID = Client.P_ID and city="Mumbai"` | 1 |
### General Instructions to the Examinee:

1. This question paper contains two parts – A and B. Each part is compulsory.
2. Part A and Part B both have choices.
3. Part-A is having MCQs.
4. Part-B is descriptive paper.
5. Part-B has 3 sections –
   a. Section – I is short answer questions of 2 marks each, having 5 questions, out of which 2 questions having internal options.
   b. Section – II is long answer questions of 3 marks each, having 4 questions, out of which 2 questions having internal options.
   c. Section – III is very long answer questions of 4 marks each, having 2 questions with internal options.

<table>
<thead>
<tr>
<th>Part-A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(Attempt any 5 questions from question no 1 to 7.)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. All aggregate functions except ___________ ignore null values in their input collection.</td>
<td></td>
</tr>
<tr>
<td>(a) Count (attribute)</td>
<td></td>
</tr>
<tr>
<td>(b) Count (*)</td>
<td></td>
</tr>
<tr>
<td>(c) Avg ()</td>
<td></td>
</tr>
<tr>
<td>(d) Sum ()</td>
<td></td>
</tr>
<tr>
<td>2. Which is not a constraint in SQL?</td>
<td></td>
</tr>
<tr>
<td>(a) Unique</td>
<td></td>
</tr>
<tr>
<td>(b) Distinct</td>
<td></td>
</tr>
<tr>
<td>(c) Primary key</td>
<td></td>
</tr>
<tr>
<td>(d) Not Null</td>
<td></td>
</tr>
<tr>
<td>3. Stack is a data structure that follows___________ order</td>
<td></td>
</tr>
<tr>
<td>(a) FIFO</td>
<td></td>
</tr>
<tr>
<td>(b) LIFO</td>
<td></td>
</tr>
<tr>
<td>(c) FILO</td>
<td></td>
</tr>
<tr>
<td>(d) LILO</td>
<td></td>
</tr>
<tr>
<td>4. A device used to connect dissimilar networks is called...........</td>
<td></td>
</tr>
<tr>
<td>(a) hub</td>
<td></td>
</tr>
<tr>
<td>(b) switch</td>
<td></td>
</tr>
<tr>
<td>(c) bridge</td>
<td></td>
</tr>
<tr>
<td>(d) gateway</td>
<td></td>
</tr>
<tr>
<td>5. Which of these is not an example of unguided media?</td>
<td></td>
</tr>
<tr>
<td>(a) Optical Fibre Cable</td>
<td></td>
</tr>
<tr>
<td>(b) Radio wave</td>
<td></td>
</tr>
</tbody>
</table>
6. In a stack, if a user tries to remove an element from an empty stack, it is called ___________.
   (a) Overflow  
   (b) Underflow  
   (c) Empty collection  
   (d) Garbage collection

7. Which is known as range operator in MySQL.
   (a) IN  
   (b) BETWEEN  
   (c) IS  
   (d) DISTINCT

---

**Part-B**

**(Section - I)**

8. Expand the following terms:  
   a) POP3  b) TCP/IP  c) VoIP  d) HTTPS

9. Differentiate between WHERE and HAVING clause.

10. Give the differences between HTML and XML.  
    OR  
    Differentiate between Circuit and Packet Switching.

11. Differentiate between fetchone() and fetchall() methods with suitable examples for each

12. What is the difference between hub and switch? Which is more preferable in a large network of computers and why?  
    OR  
    Differentiate between WAN and MAN. Also give an example of WAN.

**(Section - II)**

13. Write a function in Python PUSH(Arr), where Arr is a list of numbers. From this list push all numbers divisible by 5 into a stack implemented by using a list. Display the stack if it has at least one element, otherwise display appropriate error message.  
    OR  
    Write a function in Python POP(Arr), where Arr is a stack implemented by a list of numbers. The function returns the value deleted from the stack.

14. Write the outputs of the SQL queries (i) to (iii) based on the relations Client and Product given below:

### Client

<table>
<thead>
<tr>
<th>C_ID</th>
<th>ClientName</th>
<th>City</th>
<th>P_ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Cosmetic Shop</td>
<td>Delhi</td>
<td>TP01</td>
</tr>
<tr>
<td>02</td>
<td>Total Health</td>
<td>Mumbai</td>
<td>FW05</td>
</tr>
<tr>
<td>03</td>
<td>Live Life</td>
<td>Delhi</td>
<td>BS01</td>
</tr>
<tr>
<td>04</td>
<td>Pretty Woman</td>
<td>Delhi</td>
<td>SH06</td>
</tr>
<tr>
<td>05</td>
<td>Dreams Delhi</td>
<td>Delhi</td>
<td>TP01</td>
</tr>
</tbody>
</table>

### Product

<table>
<thead>
<tr>
<th>P_ID</th>
<th>ProductName</th>
<th>Manufacturer</th>
<th>Price</th>
<th>Discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP01</td>
<td>Talcom Powder</td>
<td>LAK</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>FW05</td>
<td>Face Wash</td>
<td>ABC</td>
<td>45</td>
<td>5</td>
</tr>
<tr>
<td>BS01</td>
<td>Bath Soap</td>
<td>ABC</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>SH06</td>
<td>Shampoo</td>
<td>XYZ</td>
<td>120</td>
<td>10</td>
</tr>
</tbody>
</table>
(i) SELECT count(discount) FROM Product;
(ii) SELECT Manufacturer ,Max(Price), Min(Price) FROM Product group by manufacturer;
(iii) SELECT ProductName, Client.ClientName FROM Product, Client WHERE Product.P_ID = Client.P_ID AND Client.City=”Mumbai”;

15. An organization **HiTech Solutions** is considering to maintain their employees records using SQL to store the data. As a database administrator, Dimple has decided that:
- Name of the database - HITECH
- Name of the table - HRDATA
- The attributes of HRDATA are as follows:
  - ECode – Numeric
  - EName – character of size 30
  - Desig – Character of size 15
  - Sal – numeric

<table>
<thead>
<tr>
<th>ECode</th>
<th>EName</th>
<th>Desig</th>
<th>Sal</th>
</tr>
</thead>
<tbody>
<tr>
<td>80001</td>
<td>Sunishka Guha</td>
<td>Programmer</td>
<td>50000</td>
</tr>
<tr>
<td>80004</td>
<td>Tanya Chandra</td>
<td>Manager</td>
<td>65000</td>
</tr>
<tr>
<td>80007</td>
<td>Sanjana Kapoor</td>
<td>Programmer</td>
<td>45000</td>
</tr>
<tr>
<td>80008</td>
<td>Tejas Sahu</td>
<td>Admin</td>
<td>55000</td>
</tr>
<tr>
<td>80012</td>
<td>Aditya Kumar</td>
<td>Executive</td>
<td>35000</td>
</tr>
</tbody>
</table>

(i) Identify the attribute best suitable to be declared as a primary key.
(ii) Write the degree and cardinality of the table HRDATA.
(iii) Write command to insert following data in the table:
    ECode = 80015, Ename = “Aashifa” Sal = 43000

16. What do you understand by Primary Key, Candidate Key and Alternate Key in a table? In the table given below, identify the Primary, candidate and alternate keys –

<table>
<thead>
<tr>
<th>Rno</th>
<th>Stud_Name</th>
<th>Aadhar_no</th>
<th>UID</th>
<th>Admin_no</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>1201</td>
<td>Arpita Kar</td>
<td>112335451254</td>
<td>2236121</td>
<td>2301</td>
<td>XII A</td>
</tr>
<tr>
<td>1202</td>
<td>Parishtha Peter</td>
<td>365214529856</td>
<td>2236122</td>
<td>1407</td>
<td>XII B</td>
</tr>
<tr>
<td>1203</td>
<td>Janhvi Sinha</td>
<td>214532562144</td>
<td>2236123</td>
<td>803</td>
<td>XII B</td>
</tr>
<tr>
<td>1204</td>
<td>Shubham Sen</td>
<td>121136524521</td>
<td>2236124</td>
<td>510</td>
<td>XII A</td>
</tr>
<tr>
<td>1205</td>
<td>Brijesh Yadav</td>
<td>323354552155</td>
<td>2236125</td>
<td>102</td>
<td>XII C</td>
</tr>
</tbody>
</table>

OR

Explain any three aggregate functions of SQL with suitable example of each taking the following table into consideration –

<table>
<thead>
<tr>
<th>Empno</th>
<th>Emp_Name</th>
<th>Department</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>E123</td>
<td>Ankush Das</td>
<td>Sales</td>
<td>35000</td>
</tr>
<tr>
<td>E034</td>
<td>Snigdha Sahu</td>
<td>Sales</td>
<td>35000</td>
</tr>
<tr>
<td>E245</td>
<td>Neeraj Kapoor</td>
<td>Finance</td>
<td>55000</td>
</tr>
<tr>
<td>E112</td>
<td>Shweta Jagtap</td>
<td>Marketing</td>
<td>45000</td>
</tr>
<tr>
<td>E089</td>
<td>Rekha Sao</td>
<td>HR</td>
<td>65000</td>
</tr>
</tbody>
</table>
17. Consider the following tables Supplier and Consumer. Write SQL commands for the statements (a) to (d).

**Supplier**

<table>
<thead>
<tr>
<th>SupplierID</th>
<th>SupplierName</th>
<th>SupplierAddress</th>
<th>SupplierCity</th>
</tr>
</thead>
<tbody>
<tr>
<td>JR01</td>
<td>Rohit Bhalla</td>
<td>14, Floret Appt</td>
<td>Jaipur</td>
</tr>
<tr>
<td>PH02</td>
<td>Harish Nagar</td>
<td>A3, Gandhi Lane</td>
<td>Panjim</td>
</tr>
<tr>
<td>PS15</td>
<td>Subrat Ray</td>
<td>14/B, Surya Vihar</td>
<td>Panjim</td>
</tr>
<tr>
<td>JT50</td>
<td>Tina Chandran</td>
<td>12-H, Bank Colony</td>
<td>Jaipur</td>
</tr>
</tbody>
</table>

**Consumer**

<table>
<thead>
<tr>
<th>C_ID</th>
<th>SupplierID</th>
<th>CName</th>
<th>CAddress</th>
<th>Ccity</th>
</tr>
</thead>
<tbody>
<tr>
<td>C101</td>
<td>JR01</td>
<td>Varun Mishra</td>
<td>5, Central Avenue</td>
<td>Delhi</td>
</tr>
<tr>
<td>C342</td>
<td>PH02</td>
<td>Sonia Singh</td>
<td>116, Block A</td>
<td>Delhi</td>
</tr>
<tr>
<td>C112</td>
<td>JR01</td>
<td>Prabhu S</td>
<td>2A, Andheri East</td>
<td>Mumbai</td>
</tr>
<tr>
<td>C008</td>
<td>PS15</td>
<td>Abhishek Das</td>
<td>B5, CS Terminals</td>
<td>Panjim</td>
</tr>
<tr>
<td>C035</td>
<td>JT50</td>
<td>Rahul Jain</td>
<td>13,B Mayur Vihar</td>
<td>Mumbai</td>
</tr>
</tbody>
</table>

(a) To display the C_ID, Supplier name, Supplier Address, Consumer Name and Consumer Address for every Consumer

(b) To display Consumer details in ascending order of CName

(c) To display number of Consumers from each city

(d) To display the details of suppliers whose supplier city is ‘Panjim’

OR

Write the outputs of the SQL queries (i) to (iv) based on the relations Drink and Consumer given below:

**Table: Drink**

<table>
<thead>
<tr>
<th>D_ID</th>
<th>DrinkName</th>
<th>Company</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP01</td>
<td>Aam Panna</td>
<td>Haldiram</td>
<td>185.00</td>
</tr>
<tr>
<td>OS23</td>
<td>Orange Squash</td>
<td>Rasna</td>
<td>75.00</td>
</tr>
<tr>
<td>MP22</td>
<td>Mango pulp</td>
<td>Haldiram</td>
<td>190.00</td>
</tr>
<tr>
<td>LI12</td>
<td>Lichi</td>
<td>Real</td>
<td>125.00</td>
</tr>
<tr>
<td>LE02</td>
<td>Lemonade</td>
<td>Real</td>
<td>110.00</td>
</tr>
</tbody>
</table>

**Table:Consumer**

<table>
<thead>
<tr>
<th>C_ID</th>
<th>ConsumerName</th>
<th>Address</th>
<th>D_ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>D Mart</td>
<td>Junwani, Durg</td>
<td>LI12</td>
</tr>
<tr>
<td>6</td>
<td>Rajesh Super Bazaar</td>
<td>A Market Sec-10</td>
<td>OS23</td>
</tr>
<tr>
<td>12</td>
<td>Shubham K Mart</td>
<td>Junwani, Durg</td>
<td>AP01</td>
</tr>
<tr>
<td>15</td>
<td>Big Bazaar</td>
<td>Surya Mall, Bilalai</td>
<td>LE02</td>
</tr>
</tbody>
</table>

(i) SELECT count(DISTINCT Address) FROM Consumer;

(ii) SELECT Company, MAX(Price), MIN(Price), COUNT(*) from Drink GROUP BY Company;


(iv) SELECT DrinkName from Drink where DrinkName like “-a%”;
18. Dhanvridhhi Investment Pvt. Ltd. has four branches in a Campus, named Durg, Bhilai, Raipur and Charoda. Dhanvridhhi Investment Pvt. Ltd. wants to establish the networking between all the four offices. A rough layout of the same is as follows:

Approximate distances between these offices as per network survey team are as follows:

<table>
<thead>
<tr>
<th>Place From</th>
<th>Place To</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durg</td>
<td>Bhilai</td>
<td>30 m</td>
</tr>
<tr>
<td>Bhilai</td>
<td>Charoda</td>
<td>40 m</td>
</tr>
<tr>
<td>Charoda</td>
<td>Raipur</td>
<td>25 m</td>
</tr>
<tr>
<td>Durg</td>
<td>Raipur</td>
<td>150 m</td>
</tr>
<tr>
<td>Bhilai</td>
<td>Raipur</td>
<td>105 m</td>
</tr>
<tr>
<td>Durg</td>
<td>Charoda</td>
<td>60 m</td>
</tr>
</tbody>
</table>

In continuation of the above, the company experts have planned to install the following number of computers in each of their offices:

<table>
<thead>
<tr>
<th>Office</th>
<th>No. of computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durg</td>
<td>40</td>
</tr>
<tr>
<td>Bhilai</td>
<td>80</td>
</tr>
<tr>
<td>Charoda</td>
<td>200</td>
</tr>
<tr>
<td>Raipur</td>
<td>60</td>
</tr>
</tbody>
</table>

(i) Suggest the most suitable place (i.e., Block/Center) to install the server of this organization with a suitable reason.

(ii) Which device will you suggest to be placed/installed in each of these offices to efficiently connect all the computers within these offices?

(iii) Suggest the placement of a Repeater in the network with justification.

(iv) The organization is planning to connect its new office in Delhi, which is more than 1250 km current location. Which type of network out of LAN, MAN, or WAN will be formed? Justify your answer.

OR

“Ujjwal Patra” an NGO is planning to setup its new campus at Pondicherry for its Web-based activities. The campus has four(04) UNITS as shown below:
Distances between above UNITs are given here’s under:

<table>
<thead>
<tr>
<th>Unit-1</th>
<th>Unit-2</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin</td>
<td>Training</td>
<td>65 m</td>
</tr>
<tr>
<td>Admin</td>
<td>Resource</td>
<td>120 m</td>
</tr>
<tr>
<td>Admin</td>
<td>Finance</td>
<td>100 m</td>
</tr>
<tr>
<td>Finance</td>
<td>Training</td>
<td>60 m</td>
</tr>
<tr>
<td>Finance</td>
<td>Resource</td>
<td>40 m</td>
</tr>
<tr>
<td>Training</td>
<td>Resource</td>
<td>50 m</td>
</tr>
</tbody>
</table>

No. of Computers in various UNITs are:

<table>
<thead>
<tr>
<th>Unit</th>
<th>No. of computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin</td>
<td>150</td>
</tr>
<tr>
<td>Finance</td>
<td>25</td>
</tr>
<tr>
<td>Training</td>
<td>90</td>
</tr>
<tr>
<td>Resource</td>
<td>75</td>
</tr>
</tbody>
</table>

(i) Suggest an ideal cable layout for connecting the above UNITs.
(ii) Which network device is used to connect the computers in all UNITs?
(iii) Suggest the placement of Repeater in the UNITs of above network.
(iv) NGO is planning to connect its Regional Office at Chennai, Tamilnadu. Which out of the following wired communication, will you suggest for a very high-speed connectivity?
   (a) Twisted Pair cable  (b) Ethernet cable  (c) Optical Fiber

---------All the Best---------
General Instructions to the Examinee:

1. rThis question paper contains two parts – A and B. Each part is compulsory.
2. Part A and Part B both have choices.
3. Part-A is having MCQs
4. Part-B is descriptive paper.
5. Part-B has 3 sections –
   a. Section – I is short answer questions of 2 marks each, having 5 questions, out of which 2 questions having internal options.
   b. Section – II is long answer questions of 3 marks each, having 4 questions, out of which 2 questions having internal options.
   c. Section – III is very long answer questions of 4 marks each, having 2 questions with internal options.

NOTE: Answers are suggestive. Marks can be given for any other valid and correct answer.

| Part-A |  
|--------|---|
| Attempt any 5 questions from question no 1 to 7.) |  
| 1. All aggregate functions except ___________ ignore null values in their input collection.  
   (a) Count (attribute)  
   (b) Count (*)  
   (c) Avg ()  
   (d) Sum () | B  
| 2. Which is not a constraint in SQL?  
   (a) Unique  
   (b) Distinct  
   (c) Primary key  
   (d) Not Null | B  
| 3. Stack is a data structure that follows__________ order  
   (a) FIFO  
   (b) LIFO  
   (c) FILO  
   (d) LILO | C  
| 4. A device used to connect dissimilar networks is called.........  
   (a) hub  
   (b) switch  
   (c) bridge  
   (d) gateway | D  
| 5. Which of these is not an example of unguided media?  
   (a) Optical Fibre Cable  
   (b) Radio wave  
   (c) Bluetooth  
   (d) Satellite | A |
6. In a stack, if a user tries to remove an element from an empty stack, it is called _________

   (a) Overflow  
   (b) Underflow  
   (c) Empty collection  
   (d) Garbage collection  

   Answer – (b) Underflow  

7. Which is known as range operator in MySQL.

   (a) IN  
   (b) BETWEEN  
   (c) IS  
   (d) DISTINCT  

   Answer – (b) BETWEEN  

---

8. Expand the following terms:
   a) POP3  
   b) TCP/IP  
   c) VoIP  
   d) HTTPS  

   Answer –
   a) Post Office Protocol 3  
   b) Transmission Control Protocol/ Internet Protocol  
   c) Voice over Internet Protocol  
   d) Hyper Text Transfer Protocol Secure  

   ½  
   ½  
   ½  
   ½  

---

9. Differentiate between WHERE and HAVING clause.

   Answer –
   WHERE Clause is used to filter the records from the table or used while joining more than one table. Only those records will be extracted who are satisfying the specified condition in WHERE clause. It can be used with SELECT, UPDATE, DELETE statements.

   HAVING Clause is used to filter the records from the groups based on the given condition in the HAVING Clause. Those groups who will satisfy the given condition will appear in the final result. It can be used only with GROUP BY clause.

---

10. Give the differences between HTML and XML.

    Answer –

    | HTML | XML |
    |------|-----|
    | Is a markup language. | Is a standard markup language that defines other markup languages? |
    | Is not case sensitive. | Is case sensitive. |
    | Has its own predefined tags | Tags are defined as per the need of the programmer. XML is flexible as tags can be defined when needed. |
    | Closing tags are not necessarily needed. | Closing tags are used mandatorily. |
    | Static in nature. | Dynamic in nature. |

   Note: 2 marks for any 2 valid differences
Differentiate between Circuit and Packet Switching.

**Answer** –

<table>
<thead>
<tr>
<th>Circuit Switching</th>
<th>Packet Switching</th>
</tr>
</thead>
<tbody>
<tr>
<td>In circuit switching there are 3 phases i) Connection Establishment. ii) Data Transfer. iii) Connection Released.</td>
<td>In Packet switching directly data transfer takes place.</td>
</tr>
<tr>
<td>In circuit switching, each data unit know the entire path address which is provided by the source.</td>
<td>In Packet switching, each data unit just know the final destination address intermediate path is decided by the routers.</td>
</tr>
<tr>
<td>Circuit switching is more reliable.</td>
<td>Packet switching is less reliable.</td>
</tr>
<tr>
<td>It is not a store and forward technique.</td>
<td>It is a store and forward technique.</td>
</tr>
<tr>
<td>In Circuit Switching there is a physical path between the source and the destination</td>
<td>In Packet Switching there is no physical path between the source and the destination</td>
</tr>
</tbody>
</table>

Note: 2 marks for any 2 valid differences

11. Differentiate between fetchone() and fetchall() methods with suitable examples for each.

**Answer** –

- `fetchall()` fetches all the rows of a query result. An empty list is returned if there is no record to fetch the cursor.
- `fetchone()` method returns one row or a single record at a time. It will return None if no more rows / records are available.

(1 mark for valid difference and 1 mark for correct example)

12. What is the difference between hub and switch? Which is more preferable in a large network of computers and why?

**Answer** –

- Hub forwards the message to every node connected and create a huge traffic in the network hence reduces efficiency whereas a Switch is also called intelligent hub since it redirects the received information/ packet to the intended node(s).
- In a large network a switch is preferred to reduce the unwanted traffic in the network which may also reduce the bandwidth and cause network congestion.

(1 mark for each)

OR

Differentiate between WAN and MAN. Also give an example of WAN.

**Answer** –

- WAN is also called as Wide Area Network. It is a network of computing devices crossing the limits of city, country or continent. It covers area of over hundreds
or thousands of kilometres radius. For example: Network of ATMs, BANKs, National or International organization offices spread over a country or continent.

MAN is also called as Metropolitan Area Network. It is a network of communicating devices within a city. It covers an area of few kilometres to few hundreds kilometres. For example: Network of schools, bank, and government offices within a city.

Best example of WAN is the Internet.
(1 mark for each)

(Section - II)

13. Write a function in Python PUSH(Arr), where Arr is a list of numbers. From this list push all numbers divisible by 5 into a stack implemented by using a list. Display the stack if it has at least one element, otherwise display appropriate error message.

Answer –
```python
def PUSH(Arr, value):
    s = []
    for x in range(0, len(Arr)):
        if Arr[x] % 5 == 0:
            s.append(Arr[x])
        if len(s) == 0:
            print("Empty Stack")
        else:
            print(s)
```

OR

Write a function in Python POP(Arr), where Arr is a stack implemented by a list of numbers. The function returns the value deleted from the stack.

Answer –
```python
def popStack(st):
    if len(st) == 0:
        print("Underflow")
    else:
        L = len(st)
        val = st[L - 1]
        print(val)
        st.pop(L - 1)
```

Note: Full marks can be awarded for any other correct logic.

14. Write the outputs of the SQL queries (i) to (iii) based on the relations Client and Product given below:

<table>
<thead>
<tr>
<th>C_ID</th>
<th>ClientName</th>
<th>City</th>
<th>P_ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Cosmetic Shop</td>
<td>Delhi</td>
<td>TP01</td>
</tr>
<tr>
<td>02</td>
<td>Total Health</td>
<td>Mumbai</td>
<td>FW05</td>
</tr>
<tr>
<td>03</td>
<td>Live Life</td>
<td>Delhi</td>
<td>BS01</td>
</tr>
<tr>
<td>04</td>
<td>Pretty Woman</td>
<td>Delhi</td>
<td>SH06</td>
</tr>
<tr>
<td>05</td>
<td>Dreams Delhi</td>
<td>Delhi</td>
<td>TP01</td>
</tr>
</tbody>
</table>
### Product

<table>
<thead>
<tr>
<th>P_ID</th>
<th>ProductName</th>
<th>Manufacturer</th>
<th>Price</th>
<th>Discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP01</td>
<td>Talcum Powder</td>
<td>LAK</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>FW05</td>
<td>Face Wash</td>
<td>ABC</td>
<td>45</td>
<td>5</td>
</tr>
<tr>
<td>BS01</td>
<td>Bath Soap</td>
<td>ABC</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>SH06</td>
<td>Shampoo</td>
<td>XYZ</td>
<td>120</td>
<td>10</td>
</tr>
<tr>
<td>FW06</td>
<td>Face Wash</td>
<td>XYZ</td>
<td>95</td>
<td></td>
</tr>
</tbody>
</table>

(i) SELECT count(discount) FROM Product ;  
**Answer – 2**

(ii) SELECT Manufacturer ,Max(Price), Min(Price) FROM Product group by manufacturer;  
**Answer –**  
LAK   40   40  
ABC   55   45  
XYZ   120  95  

(iii) SELECT ProductName, Client.ClientName FROM Product, Client  
WHERE Product.P_ID = Client.P_ID AND Client.City=”Mumbai”;  
**Answer –**  
Talcum Powder     Cosmetic Shop  
Talcum Powder     Dreams Delhi  
Facewash        Total Health  
Bath Soap       Live Life  
Shampoo          Pretty Woman

15. An organization **HiTech Solutions** is considering to maintain their employees’ records using SQL to store the data. As a database administrator, Dimple has decided that:  
- Name of the database - HITECH  
- Name of the table - HRDATA  
- The attributes of HRDATA are as follows:  
  - ECode – Numeric  
  - EName – character of size 30  
  - Desig – Character of size 15  
  - Sal – numeric

**Table: HRDATA**

<table>
<thead>
<tr>
<th>ECode</th>
<th>EName</th>
<th>Desig</th>
<th>Sal</th>
</tr>
</thead>
<tbody>
<tr>
<td>80001</td>
<td>Sunishka Guha</td>
<td>Programmer</td>
<td>50000</td>
</tr>
<tr>
<td>80004</td>
<td>Tanya Chandra</td>
<td>Manager</td>
<td>65000</td>
</tr>
<tr>
<td>80007</td>
<td>Sanjana Kapoor</td>
<td>Programmer</td>
<td>45000</td>
</tr>
<tr>
<td>80008</td>
<td>Tejas Sahu</td>
<td>Admin</td>
<td>55000</td>
</tr>
<tr>
<td>80012</td>
<td>Aditya Kumar</td>
<td>Executive</td>
<td>35000</td>
</tr>
</tbody>
</table>

(i) Identify the attribute best suitable to be declared as a primary key.  
**Answer – Ecode**

(ii) Write the degree and cardinality of the table HRDATA.
(iii) Write command to insert following data in the table:
ECode = 80015, Ename = “Aashifa” Sal = 43000
Answer – insert into HRDATA values(80015, “Aashifa”, 43000);

16. What do you understand by Primary Key, Candidate Key and Alternate Key in a table? In the table given below, identify the Primary, candidate and alternate keys –

<table>
<thead>
<tr>
<th>Rno</th>
<th>Stud_Name</th>
<th>Aadhar_no</th>
<th>UID</th>
<th>Admin_no</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>1201</td>
<td>Arpita Kar</td>
<td>112235451254</td>
<td>2236121</td>
<td>2301</td>
<td>XII A</td>
</tr>
<tr>
<td>1202</td>
<td>Farishta Peter</td>
<td>365214529856</td>
<td>2236122</td>
<td>1407</td>
<td>XII B</td>
</tr>
<tr>
<td>1203</td>
<td>Janhvi Sinha</td>
<td>214532562144</td>
<td>2236123</td>
<td>803</td>
<td>XII B</td>
</tr>
<tr>
<td>1204</td>
<td>Shubham Sen</td>
<td>121136524521</td>
<td>2236124</td>
<td>510</td>
<td>XII A</td>
</tr>
<tr>
<td>1205</td>
<td>Brijesh Yadav</td>
<td>323354552155</td>
<td>2236125</td>
<td>102</td>
<td>XII C</td>
</tr>
</tbody>
</table>

Answer –
Candidate keys – All those key or key combinations in a table that can uniquely identify a record in a table is candidate key
Primary Key – A candidate key selected by the administrator to serve the purpose of unique key is called a primary key.
Alternate key – All those candidate keys that could not become Primary key are alternate keys.

In the table –
Candidate keys – Rno, Aadhar_no, UID and Admin_no
Primary Key – Rno or any one from above
Alternate keys – All candidate keys except the one selected for primary key.

(1 mark each for definition and example)

OR

Explain any three aggregate functions of SQL with suitable example of each taking the following table into consideration –

<table>
<thead>
<tr>
<th>Empno</th>
<th>Emp_Name</th>
<th>Department</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>E123</td>
<td>Ankush Das</td>
<td>Sales</td>
<td>35000</td>
</tr>
<tr>
<td>E034</td>
<td>Snigdha Sahu</td>
<td>Sales</td>
<td>35000</td>
</tr>
<tr>
<td>E245</td>
<td>Neeraj Kapoor</td>
<td>Finance</td>
<td>55000</td>
</tr>
<tr>
<td>E112</td>
<td>Shweta Jagtap</td>
<td>Marketing</td>
<td>45000</td>
</tr>
<tr>
<td>E089</td>
<td>Rekha Sao</td>
<td>HR</td>
<td>65000</td>
</tr>
</tbody>
</table>

Answer –
The following are the most commonly used SQL aggregate functions:
AVG – calculates the average of a set of values.
COUNT – counts rows in a specified table or view.
MIN – gets the minimum value in a set of values.
MAX – gets the maximum value in a set of values.
SUM – calculates the sum of values.
(2 marks for any two aggregate functions and 1 mark for correct example)
Consider the following tables Supplier and Consumer. Write SQL commands for the statements (a) to (d).

### Supplier

<table>
<thead>
<tr>
<th>SupplierID</th>
<th>SupplierName</th>
<th>SupplierAddress</th>
<th>SupplierCity</th>
</tr>
</thead>
<tbody>
<tr>
<td>JR01</td>
<td>Rohit Bhalla</td>
<td>14, Floret Appt</td>
<td>Jaipur</td>
</tr>
<tr>
<td>PH02</td>
<td>Harish Nagar</td>
<td>A3, Gandhi Lane</td>
<td>Panjim</td>
</tr>
<tr>
<td>PS15</td>
<td>Subrat Ray</td>
<td>14/B, Surya Vihar</td>
<td>Panjim</td>
</tr>
<tr>
<td>JT50</td>
<td>Tina Chandran</td>
<td>12-H, Bank Colony</td>
<td>Jaipur</td>
</tr>
</tbody>
</table>

### Consumer

<table>
<thead>
<tr>
<th>C_ID</th>
<th>SupplierID</th>
<th>CName</th>
<th>CAddress</th>
<th>Ccity</th>
</tr>
</thead>
<tbody>
<tr>
<td>C101</td>
<td>JR01</td>
<td>Varun Mishra</td>
<td>5, Central Avenue</td>
<td>Delhi</td>
</tr>
<tr>
<td>C342</td>
<td>PH02</td>
<td>Sonia Singh</td>
<td>116, Block A</td>
<td>Delhi</td>
</tr>
<tr>
<td>C112</td>
<td>JR01</td>
<td>Prabhu S</td>
<td>2A, Andheri East</td>
<td>Mumbai</td>
</tr>
<tr>
<td>C008</td>
<td>PS15</td>
<td>Abhishek Das</td>
<td>B5, CS Terminals</td>
<td>Panjim</td>
</tr>
<tr>
<td>C035</td>
<td>JT50</td>
<td>Rahul Jain</td>
<td>13,B Mayur Vihar</td>
<td>Mumbai</td>
</tr>
</tbody>
</table>

(a) To display the C_ID, Supplier name, Supplier Address, Consumer Name and Consumer Address for every Consumer

**Answer** –

```
Select C_ID, S.SupplierName, S.SupplierAddress, C.CName, C.CAddress
from Supplier S, Consumer C where C.SupplierID=S.SupplierID;
```

(b) To display Consumer details in ascending order of CName

**Answer** –

```
Select * from Consumer order by CName;
```

(c) To display number of Consumers from each city

**Answer** –

```
select Ccity, count(*) from Consumer group by Ccity;
```

(d) To display the details of suppliers whose supplier city is ‘Panjim’

**Answer** –

```
Select * from Supplier where SupplierCity = 'Panjim';
```

OR

Write the outputs of the SQL queries (i) to (iv) based on the relations Drink and Consumer given below:

### Table: Drink

<table>
<thead>
<tr>
<th>D_ID</th>
<th>DrinkName</th>
<th>Company</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP01</td>
<td>Aam Panna</td>
<td>Haldiram</td>
<td>185.00</td>
</tr>
<tr>
<td>OS23</td>
<td>Orange Squash</td>
<td>Rasna</td>
<td>75.00</td>
</tr>
<tr>
<td>MP22</td>
<td>Mango pulp</td>
<td>Haldiram</td>
<td>190.00</td>
</tr>
<tr>
<td>LI12</td>
<td>Lichi</td>
<td>Real</td>
<td>125.00</td>
</tr>
<tr>
<td>LE02</td>
<td>Lemonade</td>
<td>Real</td>
<td>110.00</td>
</tr>
</tbody>
</table>
### Table: Consumer

<table>
<thead>
<tr>
<th>C_ID</th>
<th>ConsumerName</th>
<th>Address</th>
<th>D_ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>D Mart</td>
<td>Junwani, Durg</td>
<td>LI12</td>
</tr>
<tr>
<td>6</td>
<td>Rajesh Super Bazaar</td>
<td>A Market Sec-10</td>
<td>OS23</td>
</tr>
<tr>
<td>12</td>
<td>Shubham K Mart</td>
<td>Junwani, Durg</td>
<td>AP01</td>
</tr>
<tr>
<td>15</td>
<td>Big Bazaar</td>
<td>Surya Mall, Bhilai</td>
<td>LE02</td>
</tr>
</tbody>
</table>

(i) SELECT count(DISTINCT Address) FROM Consumer;

Answer – 3

(ii) SELECT Company, MAX(Price), MIN(Price), COUNT(*) from Drink GROUP BY Company;

Answer –

<table>
<thead>
<tr>
<th>Company</th>
<th>Max Price</th>
<th>Min Price</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haldiram</td>
<td>190.00</td>
<td>185.00</td>
<td>2</td>
</tr>
<tr>
<td>Rasna</td>
<td>75.00</td>
<td>75.00</td>
<td>1</td>
</tr>
<tr>
<td>Real</td>
<td>125.00</td>
<td>110.00</td>
<td>2</td>
</tr>
</tbody>
</table>


Answer –

<table>
<thead>
<tr>
<th>ConsumerName</th>
<th>DrinkName</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>D Mart</td>
<td>Lichi</td>
<td>125.00</td>
</tr>
<tr>
<td>Rajesh Super Bazar</td>
<td>Orange Squash</td>
<td>75.00</td>
</tr>
<tr>
<td>Shubham K Mart</td>
<td>Aam Panna</td>
<td>185.00</td>
</tr>
<tr>
<td>Big Bazar</td>
<td>Lemonade</td>
<td>110.00</td>
</tr>
</tbody>
</table>

(iv) SELECT DrinkName from Drink where DrinkName like "^a%";

Answer –

Aam Panna
Mango Pulp

18. Dhanvridhhi Investment Pvt. Ltd. has four branches in a Campus, named Durg, Bhilai, Raipur and Charoda. Dhanvridhhi Investment Pvt. Ltd. wants to establish the networking between all the four offices. A rough layout of the same is as follows:

![Diagram of office locations]

Approximate distances between these offices as per network survey team are as follows:

<table>
<thead>
<tr>
<th>Place From</th>
<th>Place To</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durg</td>
<td>Bhilai</td>
<td>30 m</td>
</tr>
<tr>
<td>Bhilai</td>
<td>Charoda</td>
<td>40 m</td>
</tr>
<tr>
<td>Charoda</td>
<td>Raipur</td>
<td>25 m</td>
</tr>
<tr>
<td>Durg</td>
<td>Raipur</td>
<td>150 m</td>
</tr>
<tr>
<td>Bhilai</td>
<td>Raipur</td>
<td>105 m</td>
</tr>
<tr>
<td>Durg</td>
<td>Charoda</td>
<td>60 m</td>
</tr>
</tbody>
</table>
In continuation of the above, the company experts have planned to install the following number of computers in each of their offices:

<table>
<thead>
<tr>
<th>Office</th>
<th>No. of computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durg</td>
<td>40</td>
</tr>
<tr>
<td>Bhilai</td>
<td>80</td>
</tr>
<tr>
<td>Charoda</td>
<td>200</td>
</tr>
<tr>
<td>Raipur</td>
<td>60</td>
</tr>
</tbody>
</table>

(i) Suggest the most suitable place (i.e., Block/Center) to install the server of this organization with a suitable reason.
   Answer – Charoda, as there are more no. of systems and also 80-20 rule of network traffic.

(ii) Which device will you suggest to be placed/installed in each of these offices to efficiently connect all the computers within these offices?
    Answer – Hub/Switch

(iii) Suggest the placement of a Repeater in the network with justification.
    Answer – Between Durg and Raipur, and also Bhilai and Raipur, as the distance is more than 100 m.

(iv) The organization is planning to connect its new office in Delhi, which is more than 1250 km current location. Which type of network out of LAN, MAN, or WAN will be formed? Justify your answer.
    Answer – WAN, as the distance is more, hence WAN is suitable.

OR

“Ujjwal Patra” an NGO is planning to setup its new campus at Pondicherry for its web-based activities. The campus has four(04) UNITS as shown below:

Distances between above UNITS are given here’s under:

<table>
<thead>
<tr>
<th>Unit-1</th>
<th>Unit-2</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin</td>
<td>Training</td>
<td>65 m</td>
</tr>
<tr>
<td>Admin</td>
<td>Resource</td>
<td>120 m</td>
</tr>
<tr>
<td>Admin</td>
<td>Finance</td>
<td>100 m</td>
</tr>
<tr>
<td>Finance</td>
<td>Training</td>
<td>60 m</td>
</tr>
<tr>
<td>Finance</td>
<td>Resource</td>
<td>40 m</td>
</tr>
<tr>
<td>Training</td>
<td>Resource</td>
<td>50 m</td>
</tr>
</tbody>
</table>
No. of Computers in various UNITs are:

<table>
<thead>
<tr>
<th>Unit</th>
<th>No. of computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin</td>
<td>150</td>
</tr>
<tr>
<td>Finance</td>
<td>25</td>
</tr>
<tr>
<td>Training</td>
<td>90</td>
</tr>
<tr>
<td>Resource</td>
<td>75</td>
</tr>
</tbody>
</table>

(i) Suggest an ideal cable layout for connecting the above UNITs.  
   **Any suitable layout**  

(ii) Which network device is used to connect the computers in all UNITs?  
    **Answer – Hub/Switch**  

(iii) Suggest the placement of Repeater in the UNITs of above network.  
     **Answer – Admin and Resource, and Admin and Finance**  

(iv) NGO is planning to connect its Regional Office at Chennai, Tamilnadu.  
     Which out of the following wired communication, will you suggest for a very high-speed connectivity?  
     (b) Twisted Pair cable (b) Ethernet cable (c) **Optical Fiber**  
     **Answer – Optical Fiber**

----------xxxx----------