

KENDRIYA VIDYALAYA SANGATHAN, PATNA REGION
1st PRE BOARD EXAMINATION, 2022-23
CLASS – XII
COMPUTER SCIENCE

Max. Marks: 70

Time: 3 hrs

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A have 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 03 Long Answer type questions carrying 05 marks each.
7. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q35 against part c only.
8. All programming questions are to be answered using Python Language only.

SECTION A		
1.	Identify the incorrect variable name: a) int b) float c) while d) true	(1)
2.	What will be the data type of the expression $12/5==0$? a) True b) False c) bool d) float	(1)
3.	What will be output of the following code: d1={1:2,3:4,5:6} d2=d1.get(3,5) print(d2) a) 3 b) 4 c) 5 d) Error	(1)
4.	Consider the given expression: 8 and 13 > 10 Which of the following is the correct value of the expression? a) True b) False c) None d) NULL	(1)
5.	Fill in the blank: _____ command is used to remove a column from a table in SQL. a) update b) remove c) alter d) drop	(1)
6.	Which of the following mode in file opening statement generates an error if the file does not exist? a) a+ b) r+ c) w+ d) None of these	(1)
7.	Which of the following commands will delete a table from a MYSQL database? a) DELETE b) DROP c) REMOVE d) ALTER	(1)
8.	Fill in the blank: An alternate key is a _____, which is not the primary key of the table. a) Primary Key b) Foreign Key c) Candidate Key d) Alternate Key	(1)

19.	<p>Mohit has written a code to input a positive integer and display its factorial. His code is having errors. Rewrite the correct code and underline the corrections made. (<i>factorial of a number n is the product 1x2x3. . .n</i>)</p> <pre>n=int(input("Enter a positive integer: ")) f=0 for i in range(n): f*=i print(f)</pre>	(2)
20.	<p>Write two points of difference between LAN and MAN.</p> <p style="text-align: center;">OR</p> <p>Write two points of difference between HTML and XML.</p>	(2)
21.	<p>(a) Write a Python statement to display alternate characters of a string, named my_exam. For example, if my_exam="Russia Ukraine" The statement should display Rsi kan</p> <p>(b) Write the output of the code given below:</p> <pre>d1 = {"name": "Aman", "age": 26} d2 = d1.pop('name') print(d1, d2)</pre>	(1) (1)
22.	<p>Can a table in an RDBMS have multiple candidate keys? Can it have multiple Primary keys? Give an example to support your answer.</p>	(2)
23.	<p>(a) Write the full forms of the following: (i) VoIP (ii) IMAP (b) Name the communication medium which is used for WiFi.</p>	(1) (1)
24.	<p>Predict the output of the Python code given below:</p> <pre>def Alpha(N1):while N1: a=N1.pop() if a%5>2: print(a,end='@')else: break NUM=[13,24,12,53,34] Alpha(NUM); print(NUM)</pre> <p style="text-align: center;">OR</p> <p>Predict the output of the Python code given below:</p> <pre>T1 = tuple("Amsterdam") T2, new_list = T1[1:-1], []for i in T2: if i in 'aeiou': j=T1.index(i) new_list+=[j] print(new_list)</pre>	(2)
25.	<p>If a column score in a table match has five entries, viz. 30,65,NULL,40,NULL,then what will be the output of the following query? Select count(*), avg(score) from match;</p> <p style="text-align: center;">OR</p> <p>Write two differences between HAVING and WHERE clauses in SQL.</p>	(2)

SECTION C

26. (a) Consider the following table:
Table: Employee

EID	Name	DOB	DOJ	Salary	Project
E01	Ranjan	1990-07-12	2015-01-21	150000	P01
E02	Akhtar	1992-06-21	2015-02-01	125000	P04
E03	Muneera	1996-11-15	2018-08-19	135000	P01
E04	Alex	1991-10-25	2018-10-19	75000	P02
E05	Satyansh	1993-12-16	2018-10-19	85000	P04

What is the degree and cardinality of table Employee, if it contains only the given data? Which field fields is/are the most suitable to be the Primary key if the data shown above is only the partial data?

(b) Write the output of the queries (i) to (iv) based on the table Employee:
 (i) select name, project from employee order by project;
 (ii) select name, salary from employee where doj like'2015%';
 (iii) select name, salary from employee where salary between 100000 and 200000;
 (iv) select min(doj), max(dob) from employee;

27. Write a method count_words_e() in Python to read the content of a textfile and count the number of words ending with 'e' in the file.

Example: If the file content is as follows:
 An apple a day keeps the doctor away.
 We all pray for everyone's safety.
 A marked difference will come in our country.

The count_words_e() function should display the output as:
 No. of such words: 4

OR

Write a function reverseFile() in Python, which should read the content of a text file "TESTFILE.TXT" and display all its line in the reverse order.

Example: If the file content is as follows:
 It rained yesterday.
 It might rain today.
 I wish it rains tomorrow too.
 I love Rain.

The RainCount() function should display the output as:

```
.yadretsey deniar tI
.yadot niar thgim tI
.oot worromot sniar ti hsiw I
.niaR evol I
```

28. (a) Write the outputs of the SQL queries (i) to (iv) based on the relations Projects and Employee given below: (2)

Table: Projects

PID	PName	Startdate	Enddate
P01	Road 102 Carpeting	2022-01-28	2022-02-26
P02	Civil Lines Parking	2022-01-30	2023-01-29
P03	T-3 Renovation	2022-03-16	2022-12-15
P04	Footover Bridge K-13	2022-03-19	2023-02-01

Table: Employee

EID	Name	DOB	DOJ	Salary	Project
E01	Ranjan	1990-07-12	2015-01-21	150000	P01
E02	Akhtar	1992-06-21	2015-02-01	125000	P04
E03	Muneera	1996-11-15	2018-08-19	135000	P01
E04	Alex	1991-10-25	2018-10-19	75000	P02
E05	Satyansh	1993-12-16	2018-10-19	85000	P04

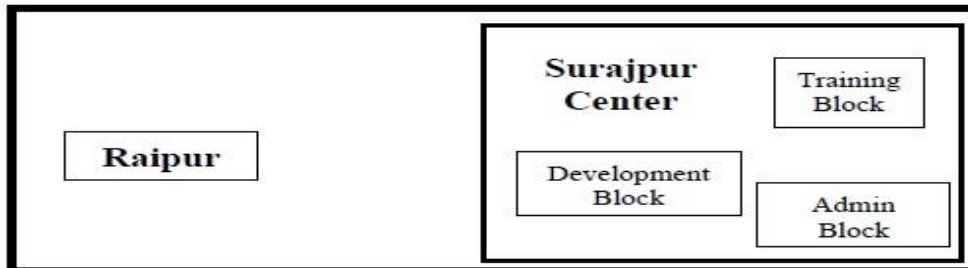
- (i) select project, count(*) from employee group by project;
- (ii) select pid, pname, eid, name from projects p,employee e where p.pid=e.project;
- (iii) select min(startdate), max(startdate) from projects;
- (iv) select avg(salary) from employee where doj between '2018-08-19' and '2018-08-31';

(b) Write the command to make Projects column of employee table a foreign key which refers to PID column of Projects table. (1)

29. Write a function AdjustList(L), where L is a list of integers. The function should reverse the contents of the list without slicing the list and without using any second list. Example: If the list initially contains 2, 15, 3, 14, 7, 9, 19, 6, 1, 10, then after reversal the list should contain 10, 1, 6, 19, 9, 7, 14, 3, 15, 2 (3)

<p>30. A nested list contains the data of visitors in a museum. Each of the inner lists contains the following data of a visitor: [V_no (int), Date (string), Name (string), Gender (String M/F), Age (int)]</p> <p>Write the following user defined functions to perform given operations on the stack named "status":</p> <p>(i) Push_element(Visitors) - To Push an object containing Gender of visitor who are in the age range of 15 to 20.</p> <p>(ii) Pop_element() - To Pop the objects from the stack and count the display the number of Male and Female entries in the stack. Also, display "Done" when there are no elements in the stack.</p> <p>For example: If the list Visitors contains:</p> <pre>[['305', '10/11/2022', "Geeta", "F", 35], ['306', '10/11/2022', "Arham", "M", 15], ['307', '11/11/2022', "David", "M", 18], ['308', '11/11/2022', "Madhuri", "F", 17], ['309', '11/11/2022', "Sikandar", "M", 13]]</pre> <p>The stack should contain</p> <pre>F M M</pre> <p>The output should be:</p> <pre>Done Female: 1 Male: 2</pre> <p style="text-align: center;">OR</p> <p>Write the following functions in Python:</p> <p>(i) Push(st, expression), where expression is a string containing a valid arithmetic expression with +, -, *, and / operators, and st is a list representing a stack. The function should push all the operators appearing in this expression into the stack st.</p> <p>(ii) Pop(st) to pop all the elements from the stack st and display them. It should also display the message 'Stack Empty' when the stack becomes empty.</p> <p>For example: If the expression is:</p> $42*5.8*16/24-8+2$ <p>Then st should contain</p> <pre>+ - / * *</pre> <p>The output should be:</p> <pre>+ - / * * Stack Empty</pre>	(3)
--	-----

31. FutureTech Corporation, a Bihar based IT training and development company, is planning to set up training centers in various cities in the coming year. Their first center is coming up in Surajpur district. At Surajpur center, they are planning to have 3 different blocks - one for Admin, one for Training and one for Development. Each block has number of computers, which are required to be connected in a network for communication, data and resource sharing. As a network consultant of this company, you have to suggest the best network related solutions for them for issues/problems raised in question nos. (i) to (v), keeping in mind the distances between various blocks/locations and other given parameters.



Distance between various blocks/locations:

Block	Distance
Development to Admin	28 m
Development to Training	105 m
Admin to Training	32 m
Surajpur Campus to Coimbatore Campus	340 km

Number of computers:

Block	Number of Computers
Development	90
Admin	40
Training	50

- (i) Suggest the most appropriate block/location to house the SERVER in the Surajpur center (out of the 3 blocks) to get the best and effective connectivity. Justify your answer. (1)
- (ii) Suggest why should a firewall be installed at the Surajpur Center? (1)
- (iii) Suggest the best wired medium and draw the cable layout (Block to Block) to most efficiently connect various blocks within the Surajpur Center. (1)
- (iv) Suggest the placement of the following devices with appropriate reasons: (1)
- a) Switch/Hub b) Router
- (v) Suggest the best possible way to provide wireless connectivity between Surajpur Center and Raipur Center. (1)

32. (a) Write the output of the code given below: (2)
- ```

p,q=8, [8]
def sum(r,s=5):
 p=r+s
 q=[r,s]
 print(p, q, sep='@')
sum(3,4)
print(p, q, sep='@')

```

(3)

(b) The code given below accepts the increments the value of Clas by 1 foreach student. The structure of a record of table Student is:

RollNo – integer; Name – string; Clas – integer; Marks – integer

Note the following to establish connectivity between Python and MYSQL:

- Username is root, Password is abc
- The table exists in a MYSQL database named **school**.

Write the following missing statements to complete the code:

```
import mysql.connector as mysql def sql_data():
con1=mysql.connect(host="localhost",user="root",password="abc")
_____ #Statement 1
crsr.execute("use school")
_____ #Statement 2
crsr.execute(query)
_____ # Statement 3
print("Data updated successfully")
```

Statement 1 – to create the cursor object.

Statement 2 – to create the query to update the table.

Statement 3- to make the updation in the database permanent

**OR**

(a) Predict the output of the code given below:

```
s="Rs.12"
n, m = len(s), ""
for i in range(0, n):
 if s[i].islower():
 m = m + s[i]
 elif s[i].isupper():
 m = m + s[i+1]
 elif s[i].isdigit():
 m = m*int(s[i])
 else: m = '@'+m
print(m)
```

(b) The code given below reads records from the table named Vehicle and displays only those records which have model later than 2010. The structure of a record of table Vehicle is:

V\_ID – integer; Name – string; Model – integer; Price – integer

Note the following to establish connectivity between Python and MYSQL:

- Username is root
- Password is abc
- The table exists in a MYSQL database named **Transport**.
- The details (RollNo, Name, Clas and Marks) are to be accepted from the user.

Write the following missing statements to complete the code:

Statement 1 – to create the cursor object

Statement 2 – to execute the query that extracts records of those vehicles whose model is greater than 2010.

Statement 3 - to read the complete result of the query into the object named data.



|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|                  | <pre> import mysql.connector as mysql  def display():     con1=mysql.connect(host="localhost",user="root",password="abc",         database="Transport")         _____ #Statement 1     print("Students with marks greater than 75 are : ")     q="Select * from vehicle where model&gt;2010"         _____ #Statement 2     data=_____ #Statement 3     for rec in data:         print(rec) </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |
| 33.              | <p>(a) What one advantage and one disadvantage of using a binary file for permanent storage?</p> <p>(b) Write a Program in Python that defines and calls the following user defined functions:</p> <p>(i) ADD() – To accept and add data of an item to a CSV file ‘events.csv’. Each record consists of Event_id, Description, Venue, Guests, and Cost.</p> <p>(ii) COUNTR() – To read the data from the file events.csv, calculate and display the average number of guests and average cost.</p> <p style="text-align: center;"><b>OR</b></p> <p>(a) Give any one point of difference between a binary file and a text file.</p> <p>(b) Write a Program in Python that defines and calls the following user defined functions:</p> <p>(i) ADD() – To accept and add data of an item to a binary file ‘events.dat’. Each record of the file is a list [Event_id, Description, Venue, Guests, Cost]. Event_Id, Description, and venue are of str type, Guests and Cost are of int type.</p> <p>(ii) COUNTR() – To read the data from the file events.dat, calculate and display the average number of guests and average cost.</p> | (5) |
| <b>SECTION E</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |
| 34.              | <p>Ifrah is a class XII student. She has created her Computer Science project in Python and saved the file with the name 'CarAgency.py'. Her code contains many blank lines.</p> <p>Now she has written another Python script to remove all the blank lines from 'CarAgency.py' and to precede each line with a line number. For example, if CarAgency.py originally contains:</p> <pre> import random, pickle  cars=[]  def estimate():     cost=0 </pre> <p>Then after the program execution, the file 'CarAgency.py' should contain:</p> <ol style="list-style-type: none"> <li>1. import random, pickle</li> <li>2. cars=[]</li> <li>3. def estimate():</li> <li>4. cost=0</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                          | (4) |

As a Python expert, help her to complete the following code (by completing statements 1, 2, 3, and 4) based on the requirement given above.

- (i) Statement-1 to import required functions.
- (ii) Statement-2 to open temp.py in suitable mode.
- (iii) Statement-3 to write line into temp.py
- (iv) To delete CarAgency.py

```

from os _____ #Statement 1
f1=open("CarAgency.py")
f2=open(_____,_____) #Statement 2
i=1
for line in f1:
 line=line.rstrip()
 if len(line)>0:
 line=str(i)+'\t'+line+'\n'
 i+=1
 _____ #Statement 3
f1.close()
f2.close()

_____ #Statement 4
rename("temp.py","CarAgency.py")

```

35. Raghav has been assigned the task to create a database, named Projects. Healso has to create following two tables in the database: (4)

Table: Projects;

| Field     | Data Type    | Remarks     |
|-----------|--------------|-------------|
| PID       | Char (5)     | Primary Key |
| PName     | Varchar (20) |             |
| Startdate | Satrtdate    |             |
| Enddate   | Enddate      |             |

Table: Employee;

| Field   | Data Type    | Remarks                                       |
|---------|--------------|-----------------------------------------------|
| EID     | Char (4)     | Primary Key                                   |
| Name    | Varchar (20) |                                               |
| DOB     | Startdate    | Cannot be NULL                                |
| DOJ     | Enddate      | Cannot be NULL                                |
| Salary  | Integer      |                                               |
| Project | Char (5)     | Foreign Key. References PID of Projects table |

Based on the given scenario, answer the following questions:

- (i) Which table should he create first – Projects or Employee? Justify your answer.
- (ii) What will be the degree of the Cartesian product of these two tables?
- (iii) Write the SQL statement to create the table Employee.
- (iv) Write the SQL statement to add a column Gender of type char(1) to the table Employee, assuming that table Employee has already been created.

-----XXXXXXXXXX-----