

COMPUTER SCIENCE

Time 3 hrs

Max. Marks : 70

General Instructions :

- (i) This question paper contains five sections, **Section A to E**.
- (ii) **All** questions are compulsory.
- (iii) **Section A** have **18** questions carrying **1 mark** each.
- (iv) **Section B** have **7** Very Short Answer type questions carrying **2 marks** each.
- (v) **Section C** have **5** Short Answer type questions carrying **3 marks** each.
- (vi) **Section D** have **2** questions carrying **4 marks** each.
- (vii) **Section E** have **3** Long Answer type questions carrying **5 marks** each. **One** internal choice is given is **Q.34 and 35**, against **Part (iii)** only.
- (viii) All programming questions are to be answered using Python Language only.

SECTION-A

1. State True or False:
A dictionary can be updated by the contents of other dictionary using the change () method. [1]
2. Jaya wants to display the records of her table in descending order of names of products. Which SQL clause she has to use? [1]
(A) Group by (B) Order by (C) Between (D) Check
3. The expression:
 $72//4 + 12 \% 5 + 9**2 - 1$ evaluates to: [1]
(A) 101 (B) Error (C) 100 (D) 99
4. What will be the output of this program? [1]

```
m = 1
n = "1"
print (str(m) + n)
```


(A) 1 (B) 2 (C) 11 (D) Syntax Error
5. The design of the database is known as _____. [1]
(A) attribute (B) database schema
(C) obstruction (D) database oriented

6. Bluetooth transmission can carry data within [1]
(A) A city (B) A country (C) A state (D) A room
7. What will be the output of this program? [1]
`p = "12"`
`q = "5"`
`r = 10`
`s = 8`
`print(p+q, r+s)`
(A) 17 18 (B) 125 108 (C) 17 108 (D) 125 18
8. The score of a student in a test is stored as a Python tuple. The test has 3 questions, with some questions having subparts whose scores are recorded separately. [1]
`score = (6, (5, (2, 1), 8, (4, 3, (1, 3, 2))))`
What will be the output of this program snippet?
(A) (1, 3, 2) (B) (2, 1) (C) 3 (D) 8
9. What will be the output of the program given below? [1]
`string = "2021-08-09 10 : 22 : 03 :: 0443 :: 06384626 :: 00001024"`
`parts = string.split("::", 2)`
`print(parts)`
(A) ['2021-08-09 10:22:03', '0443::06384626::00001024']
(B) ['2021-08-09 10', '22', '03::0443::06384626::00001024']
(C) ['2021-08-09 10:22:03', '0443', '06384626::00001024']
(D) ['2021-08-09 10:22:03', '0443', '06384626', '00001024']
10. What possible output(s) are expected to be displayed on screen at the time of execution of the program from the following code? [1]
`import random`
`AR=[20,30,40,50,60,70]`
`From=random.randint(1,3)`
`TO=random.randint(2,4)`
`for K in range(FROM,TO+1):`
`print (AR[K],end='#')`
(A) 10#40#70# (B) 30#40#50# (C) 50#60#70# (D) 40#50#70#
11. Fill in the blank: [1]
A cookie is a _____.
(A) Temporary file (B) Protocol (C) Software (D) Hardware

12. Given the following code. What should be filled in the missing blank for proper execution of the code, import random
- ```
def automatic() : #Function to return a random number between 0-1
 s=random._____
 return s
```
- (A) randint(0,100) (B) random() (C) shuffle () (D) choice [1]
13. **State True or False:** [1]  
The code written in the finally block executes every time, even if exception does not occur.
14. A table in a database can contain primary key(s). [1]  
(A) Single (B) Multiple (C) 2 (D) 3
15. Fill in the blank; [1]  
The function of a repeater is to take a weak and corrupted signal and \_\_\_\_\_ it.
16. Which of the following statement(s) are correct regarding the file access modes? [1]  
(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.

**Assertion and Reason:**

In the following questions, A statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as.

- (A) Both A and R are true and R is the correct explanation for A.  
(B) Both A and R are true and R is not correct explanation of A.  
(C) A is true but R is false.  
(D) A is false but R is true.
17. **Assertion (A):** Strings in Python are mutable.  
**Reason (R):** The first character has the index 0 and the last character has the index n-1 where n is the length of the string. [1]
18. **Assertion (A):** Joining two lists is just like adding two strings.  
**Reason (R):** The concatenation operator + is used to add two strings. [1]

**SECTION-B**

19. (a) Expand the following terms: [2]

POP3, URL

- (b) Give one difference between XML and HTML.

**OR**

- (a) Define the term bandwidth with respect to networks.

- (b) How is http different from https?

20. The code given below accepts a number as an argument and returns the reverse number. Observe the following code carefully and rewrite it after removing all syntax and logical errors. Underline all the corrections made. [2]

```
define revNumber (num) :
 rev = 0
 rem = 0
 While num > 0:
 rem == num %10
 rev = rev *10 + rem
 num = num //10
 return rev
print (revNumber (1234))
```

21. Write a function countNow (PLACES) in Python, that takes the dictionary, PLACES as an argument and displays the names (in uppercase) of the places whose names are longer than 5 characters. For example, Consider the following dictionary [2]

```
PLACES={1:"Delhi", 2:"London", 3:"Paris", 4:"New York", 5:"Doha"}
```

The output should be:

LONDON

NEW YORK

**OR**

Write a function, lenWords (STRING), that takes a string as an argument and returns a tuple containing length of each word of a string. For example, if the string is "Come let us have some fun", the tuple will have (4, 3, 2, 4, 4, 3)

22. Predict the output of the following code: [2]

```
S = "LOST"
L= [10 21 33 4]
D = { }
for I in range (len (s)) :
 if 1% 2 ==0:
 D[L. pop ()] = S[I]
 else:
 D[L. pop ()] = I + 3
for K, V in D. items ():
 print (K, V, sep = "*")
```

23. Write the Python statement for each of the following tasks using BUILT- IN functions/methods only: [2]

- (a) To insert an element 2 0 0 at the third position, in the list LI.  
(b) To check whether a string named, message ends with a full stop / period or not.

**OR**

A list named studentAge stores age of students of a class. Write the Python command to import the required module and (using built-in function) to display the most common age value from the given list.

24. Ms. Shalini has just created a table named "Employee" containing columns Ename, Department and Salary. After creating the table, she realized that she has forgotten to add a primary key column in the table. Help her in writing an SQL command to add a primary key column EmpId of integer type to the table Employee. Thereafter, write the command to insert the following record in the table: [2]

```
EmpId-999
Ename-Shweta
Department:Production
Salary:26900
```

**OR**

Zack is working in a database named SPORT, in which he has created a table named "Sports" containing columns SportId, SportName, no\_of\_players, and category.

After creating the table, he realized that the attribute, category has to be deleted from the table and a new attribute TypeSport of data type string has to be added. This attribute TypeSport cannot be left blank. Help Zack write the commands to complete both the tasks.

25. Predict the output of the following code:

[2]

```
def Changer (P, Q = 10):
 P = P/Q
 Q = P%Q
 return P
A = 200
B = 20
A = Changer (A, B)
print (A, B, sep = '$')
B = Changer (B)
Print (A, B, sep = '$', end = '###')
```

### SECTION-C

26. Predict the output of the code given below :

[3]

```
s="welcome2cs"
n = len(s)
m=""
for i in range(0,n):
 if (s[i] >= 'a' and s[i] <= 'm'):
 m = m + s[i].upper()
 elif (s[i] >= 'n' and s[i] <= 'z'):
 m = m + s[i-1]
 elif (s[i].isupper()):
 m = m + s[i].lower()
else:
 m = m + '&'
print(m)
```

27.

Table:STUDENT

[3]

| RollNo | Name    | Class | DOB        | Gender | City   | Marks |
|--------|---------|-------|------------|--------|--------|-------|
| 1      | Nanda   | X     | 06-06-1995 | M      | Agra   | 551   |
| 2      | Saurabh | XII   | 07-05-1993 | M      | Mumbai | 462   |
| 3      | Sonal   | XI    | 06-05-1994 | F      | Delhi  | 400   |
| 4      | Trisla  | XII   | 08-08-1995 | F      | Mumbai | 450   |
| 5      | Store   | XII   | 08-10-1995 | M      | Delhi  | 369   |
| 6      | Marisla | XI    | 12-12-1994 | F      | Dubai  | 250   |
| 7      | Neha    | XI    | 08-12-1995 | F      | Moscow | 377   |
| 8      | Nishant | X     | 12-06-1995 | M      | Moscow | 489   |

(A) SELECT COUNT(\*), city FROM STUDENT GROUP BY CITY HAVING COUNT (\*)>i;

(B) SELECT MAX(DOB), MIN(DOB) FROM STUDENT;

(C) SELECT NAME,GENDER FROM STUDENT WHERE CITY="Delhi";

28. Write a method `COUNTLINES()` in Python to read lines from text file 'TESTFILE.TXT' and display the lines which are not starting with any vowel.

**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 `COUNTLINES()` function should display the output as:

The number of lines not starting with any vowel-1 [3]

**OR**

Write a function, `ETCount()` in Python, which should read each character of a text file "TESTFILE.TXT" and then count and display the count of occurrence of alphabets E and T individually (including small cases e and t too). [3]

**Example :**

If the file content is as follows:

Today is a pleasant day.

It might rain today.

It is mentioned on weather sites

The `ETCount()` function should display the output as:

E or e:6

T or t:9

29. Consider the table Personal given below: [3]

**Table: TRIP**

| NO | NAME         | TDATE      | KM  | TCODE | NOP |
|----|--------------|------------|-----|-------|-----|
| 11 | Tanish Khan  | 2015-12-13 | 200 | 101   | 32  |
| 13 | Danish Sahai | 2016-06-21 | 100 | 103   | 45  |
| 15 | Ram Kumar    | 2016-02-23 | 350 | 102   | 42  |
| 12 | Fen Shen     | 2016-01-13 | 90  | 102   | 40  |
| 17 | Aan Kumar    | 2015-02-10 | 75  | 104   | 2   |
| 14 | Veena        | 2016-06-28 | 80  | 105   | 4   |
| 16 | Rajpal Kirti | 2016-06-06 | 200 | 101   | 25  |

Note :

- NO is Driver Number
- KM is Kilometre travelled
- NOP is number of travellers travelled in vehicle
- TDATE is Trip Date

Based on the table write SQL queries for the following :

- To display NO, NAME, TDATE from the table TRIP in descending order of NO.
  - To display the NAME of the drivers from the table TRIP, who are travelling by transport vehicle with code 101 or 103.
  - To display the NO and NAME of those drivers from the table TRIP, who travelled between 2015-02-10 and '2015-04-01'
- [3]**

**30.** A list contains following record of a customer.

[Customer\_name, Phone\_number, City]

Write the following user defined functions to perform given operations on the stack named 'status' :

- Push element () - To push an object containing name and Phone number of customers who live in Goa to the stack
- Pop\_element () - To pop the objects from the stack and display them. Also, display "Stack Empty" when there are no elements in the stack.

**For example :**

If the lists of customer details are :

```
["Gurdas", "99999999999", "Goa"]
["Julee", "88888888888", "Mumbai"]
["Murugan", "77777777777", "Cochin"]
["Ashmit", "1010101010", "Goa"]
```

The stack should contain

```
["Ashmit", "1010101010"]
["Gurdas", "9999999999"]
```

The output should be :

```
["Ashmit", "1010101010"]
["Gurdas", "9999999999"]
```

Stack Empty

**[3]**

**SECTION-D**

31. Write SQL queries for (i) to (iv) based on the table School and Admin given below

[4]

**Table : School**

| CODE | TEACHER      | SUBJECT   | DOJ        | PERIODS | EXPERIENCE |
|------|--------------|-----------|------------|---------|------------|
| 1001 | RAVI SHANKAR | ENGLISH   | 12/3/2000  | 24      | 10         |
| 1009 | PRIYA RAI    | PHYSICS   | 03/09/1998 | 26      | 12         |
| 1203 | LIS ANAND    | ENGLISH   | 09/04/2000 | 27      | 5          |
| 1045 | YASHRAJ      | MATHS     | 24/08/2000 | 24      | 15         |
| 1123 | GANAN        | PHYSICS   | 16/07/1999 | 28      | 3          |
| 1167 | HARISH B     | CHEMISTRY | 19/10/1999 | 27      | 5          |
| 1215 | UMESH        | PHYSICS   | 11/05/1998 | 22      | 16         |

**TABLE : ADMIN**

| CODE | GENDER | DESIGNATION    |
|------|--------|----------------|
| 1001 | MALE   | VICE PRINCIPAL |
| 1009 | FEMALE | COORDINATOR    |
| 1203 | FEMALE | COORDINATOR    |
| 1045 | MALE   | HOD            |
| 1123 | MALE   | SENIOR TEACHER |
| 1167 | MALE   | SENIOR TEACHER |
| 1215 | MALE   | HOD            |

- (i) To display each designation and count of each type for designations where count is <2.
- (ii) To display the maximum experience.
- (iii) To display names of teachers who have more than 12 years of experience in ascending order of teacher name.
- (iv) To display teacher names and corresponding designations from both the tables.
32. Rohini is a CS student and has been assigned by her teacher to write functions `ADD()` and `COUNTER()` for working with records of employees.
- (i) `ADD ()` – To accept and add data of an employee to a CSV file 'record.csv'. Each record consists of a list with field elements as `empid`, `name` and `sal` to store employee id, employee name and employee salary respectively.
- (ii) `COUNTR ()` – To count the number of records present in the CSV file named 'record.csv'.

[4]

**SECTION-E**

33. ABC is professional consultancy company. The company is planning to set up their new offices in India with its hub at Bengaluru. As a network adviser, you have to understand their requirements and suggest them the best available solutions. Their queries are mentioned as (i) to (v) below: Physical Location of the blocks of ABC.

**Human Resource      Conference      Finance**

**Block to Block Distances (int Mtr)**

| Block (From)   | Block (To) | Distance |
|----------------|------------|----------|
| Human Resource | Conference | 110      |
| Human Resource | Finance    | 40       |
| Conference     | Finance    | 80       |

Expected number of computers to be installed in each block:

| Block          | Computer |
|----------------|----------|
| Human Resource | 25       |
| Finance        | 120      |
| Conference     | 90       |

- (i) What will be the most appropriate block, where ABC should plan to install their server?
  - (ii) Which type of topology is best suited for above network?
  - (iii) What will be the best possible connectivity you will suggest to connect the new setup of offices in Chennai with its London based office.
  - (iv) Which device will be suggested by you to connect each computer in each of the buildings?
  - (v) The company wants internet accessibility in all the blocks. What would the suitable and cost-effective technology for that? [5]
34. (i) What happens when we use file open () function in Python ?
- (ii) Create file `phonebook.txt` that stores the details in following format:
- ```
Name Phone
Jivin 86666000
Kriti 1010101
```
- Obtain the details from the user. [5]

OR

- (i) What is closed attribute of a file object?
- (ii) A file `phonebook.txt` stores the details in the following format:

```
Name Phone
Jivin 86666000
Kriti 101001
```

Write a program to edit the phone numbers of "Arvind" in file. If there is no record for "Arvind" report error.

35. (i) Define the term Join with respect to RDBMS.
- (ii) Consider the tables `Product` and `Client` with structures as follows:

Product	Client
P_ID	C_ID
ProductName	CName
Manufacturer	CCity
Price	CProd

Write Python codes to display the details of products whose price is in range of 50 to 100 Both values included. Use the following information for connection.

Host: localhost

Database: cosmetics

UserId : Admin

Password : Admin@123

Table name : Product

[5]

OR

- (i) MySQL supports different character sets, which command is used to display all character sets?
- (ii) Consider the tables `Product` and `Client` with structures as follows:

Product	Client
P_ID	C_ID
ProductName	CName
Manufacturer	CCity
Price	CProd

Write Python code to display the Client Name, City from table Client