

# **SAMPLE QUESTION PAPER 3**

# **COMPUTER SCIENCE**

Time : 3 hrs Max. Marks : 70

## **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. State True or False**

**Integer** is a mutable data type in Python.

*Ans.* False

2. Which of the following Python function displays the memory id of a variable?

- (a) type()  
(b) str()  
(c) getid()  
(d) id()

*Ans.* (d) id()

- 3.** Which of the following operator performs an integer division?

- (a) \* (b) //  
(c) / (d) \*\*

*Ans.* (b) //



- 12.** The ..... clause can group records on the basis of common values in a field.  
 (a) AGGREGATE  
 (c) GROUP BY  
 (b) GROUP  
 (d) JOIN

**Ans.** (c) GROUP BY

- 13.** ..... is the base protocol for all application protocols.  
 (a) FTP  
 (c) IRCP  
 (b) TCP/IP  
 (d) Telnet

**Ans.** (b) TCP/IP

- 14.** The python function that adds a list at the end of another list is  
 (a) join()  
 (c) append()  
 (b) add()  
 (d) extend()

**Ans.** (d) extend()

- 15.** The cross join is also called  
 (a) Merging  
 (c) Natural join  
 (b) Cartesian product  
 (d) Equi join

**Ans.** (b) Cartesian product

- 16.** ..... can be created using cursor() method of connection object.  
 (a) Cursor object  
 (c) Connect  
 (b) Cursor variable  
 (d) None of these

**Ans.** (a) Cursor object

**Directions (Q. Nos. 17 and 18) are Assertion and Reason based questions.**

- 17. Assertion (A)** A Python function that accepts parameters can be called without any parameters.  
**Reason (R)** Functions can carry default values that are used, whenever values are not received in the calling function.  
 (a) Both A and R are true and R is the correct explanation of A.  
 (b) Both A and R are true but R is not the correct explanation of A.  
 (c) A is true but R is false.  
 (d) A is false but R is true.

**Ans.** (a) Both A and R are true and R is the correct explanation of A.

- 18. Assertion (A)** A CSV file is by default delimited by comma(,), but the delimiter character can be changed.  
**Reason (R)** The writerow() function for CSV files has a "delimiter" parameter that can be used to specify the delimiter to be used for a CSV file.  
 (a) Both A and R are true and R is the correct explanation of A.  
 (b) Both A and R are true but R is not the correct explanation of A.  
 (c) A is true but R is false.  
 (d) A is false but R is true.

**Ans.** (a) Both A and R are true and R is the correct explanation of A.

## Section-B

**19.** What will be the output for the following Python statement? [2]

```
L = [10, 20, 30, 40, 50]
L = L + 5
print(L)
```

**Ans.** Error, the list data type does not allow addition of integers with it. So,  $L + 5$  is an invalid statement.

**20.** Write any two disadvantages of star topology. [2]

**Ans.** (a) Costly due to individual cables for each node.  
 (b) Central node dependency.

*Or*

Why is a switch called an intelligent hub?

**Ans.** A switch is also known as intelligent hub because a hub forwards each incoming packet (data) to all the hub ports. Whereas, a switch forwards each incoming packet to the specified recipient.

**21.** (a) What will be the output of the following Python code? [1]

```
L = [10, 20]
L1=[30, 40]
L2=[50, 60]
L.append (L1)
L.extend(L2)
print(L)
```

(b) Find the output

```
>>> 11 = [1,2,3,4]
>>> 12 = [1,2,3,4]
>>> 11 > 12
```

**Ans.** (a) [10, 20, [30, 40], 50, 60]

(b) False

**22.** Mention the various advantages of using a DBMS. [2]

**Ans.** DBMS has the following advantages:

- (i) Reduced data redundancy
- (ii) Elimination of inconsistency
- (iii) Data sharing
- (iv) Data integrity
- (v) Data security
- (vi) Ease of application development

**23.** (a) Write the full forms of the following [2]

(i) WAN.                   (ii) GSM.

(b) Write down the expansion of Modem. Also, write its role in a network.

**Ans.** (a) (i) Wide Area Network.

(ii) Global System for Mobile communication.

(b) A Modem stands for ModulatorDemodulator. It is a network device used for conversion of signals from digital to analog and analog to digital.

24. Write the output of given code :

```
x = (1, 2, 3)
y = (3, 4)
t = x + y
print(t)
```

**Ans.** (1, 2, 3, 3, 4)

Or

Observe the following tuple and answer the questions that follow:

t1 = (70, 56, 'Hello', 22, 2, 'Hi', 'The', 'World', 3)

(ii) t1[- 6]

(i) t1[2 : 4]

(ii) 22

**Ans.** (i) ('Hello', 22)

25. If R1 is a relation with 8 rows and 5 columns, then what will be the cardinality of R1?

If 5 rows are added more, what will be the Degree of the table now?

**Ans.** Cardinality means the number of rows in a table. Degree means the number of columns of a table.

Relation R1 has 8 rows, so cardinality will be 8.

If 5 rows are added cardinality become  $8+5=13$ . Degree remains the same, that is 5.

Or

Identify commands/functions for the following actions

(i) To display only records of Trains from the Train table whose starting station is "NDLS". (Column name for starting station is "Start", table name is "Train")

(ii) To get the average of percentage of students (Table name : "Student", Percentage column name "Perc").

**Ans.** (i) SELECT \* FROM Train WHERE Start="NDLS";

(ii) SELECT AVG(Perc) FROM Student ;

## Section-C

26. (a) Consider the tables CITY and LOCATION given below.

Table : CITY

Field Name	Data Type	Remarks
CITYCODE	CHAR(5)	Primary Key
CITYNAME	CHAR(30)	
SIZE	INTEGER	
AVGTEMP	INTEGER	
POPULATIONRATE	INTEGER	
POPULATION	INTEGER	

Table : Location

Citycode	Lname
C1	East
C2	West
C3	South
C4	North

Write a command to display the Cityname and corresponding Location name (Lname), if the average temperature is greater than 35 from the tables.

(b) Write outputs for the SQL commands (i) to (iv) based on the table CUSTOMER given below:

TABLE: CUSTOMER

CID	CNAME	GENDER	SID	AREA
1001	R SHARMA	FEMALE	101	NORTH
1002	M R TIWARY	MALE	102	SOUTH
1003	M K KHAN	MALE	103	EAST
1004	A K SINGH	MALE	102	EAST
1005	S SEN	FEMALE	101	WEST
1006	R DUBEY	MALE	104	NORTH
1007	M AGARWAL	FEMALE	104	NORTH
1008	S DAS	FEMALE	103	SOUTH
1009	R K PATIL	MALE	102	NORTH
1010	N KRISHNA MURTY	MALE	102	SOUTH

- (i) SELECT COUNT(\*), GENDER FROM CUSTOMER GROUP BY GENDER;
- (ii) SELECT CNAME FROM CUSTOMER WHERE CNAME LIKE 'L%';
- (iii) SELECT DISTINCT AREA FROM CUSTOMER;
- (iv) SELECT COUNT(\*) FROM CUSTOMER WHERE GENDER='MALE';

Ans. (a) SELECT C. Cityname , L.Lname FROM City C,  
LOCATION L WHERE C.Citycode= L. Citycode AND AVGTEMP>35;

(i)	COUNT (*)	GENDER
4		FEMALE
6		MALE

(ii) No rows selected

(iii)	DISTINCT AREA
	NORTH
	SOUTH
	EAST
	WEST

(iv)	COUNT (*)
	6

27. Write a Python program that read the data from file 'original.dat' and delete the line(s) having word (passed as an argument). Then write these data after removing lines into file 'duplicate.dat'. [3]

Ans. import os

```
def Delete (word):
    file1=open('original.dat','rb')
    nfile=open('duplicate.dat','wb')
    while True :
        line=file1.readline()
        if not line:
            break
        else :
            if word in line :
                pass
            else:
                print(line)
                nfile.write(line)
    file1.close()
    nfile.close()
```

*Or*  
Write a program in Python to open a text file "lines.txt" and display all those words whose length is greater than 5.

**Ans.** f=open("lines.txt")

```
data=f.read()
str=data.split(' ')
print("Words with length greater than 5")
for w in str:
    if len(w)>5 :
        print(w)
f.close()
```

**28.** (a) Answer the questions (i) to (iv) on the basis of the following tables SHOPPE and ACCESSORIES

TABLE: SHOPPE

Id	SName	Area
S001	ABC Computeronics	CP
S002	All Infotech Media	GK II
S003	Tech Shoppe	CP
S004	Geeks Tecno Soft	Nehru Place
S005	Hitech Tech Store	Nehru Place

TABLE: ACCESSORIES

No	Name	Price	Id
A01	Mother Board	12000	S01
A02	Hard Disk	5000	S01
A03	Keyboard	500	S02
A04	Mouse	300	S01
A05	Mother Board	13000	S02
A06	Keyboard	400	S03
A07	LCD	6000	S04
T08	LCD	5500	S05
T09	Mouse	350	S05
T10	Hard Disk	4500	S03

- To display Name and Price of all the ACCESSORIES in ascending order of their Price
- To display Id and SName of all SHOPPE located in Nehru Place.
- To display Minimum and Maximum Price of each Name of ACCESSORIES.
- To display Name, Price of all ACCESSORIES and their respective SName, where the Id available.

- (b) Write a command to add a new column Remarks varchar(30) to the ACCESSORIES table so that it can store remarks about the product.

**Ans.** (a) (i) SELECT Name, Price FROM ACCESSORIES ORDER BY Price;

(ii) SELECT Id, SName FROM SHOPPE 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, SHOPPE S WHERE A.Id = S.Id;  
But this query enable to show the result because A.Id and S.Id are not identical.

(b) ALTER TABLE ACCESSORIES ADD COLUMN Remarks varchar(30);

29. Write a userdefined function parser(L) that accepts a list as parameter and creates another two lists storing the numbers from the original list , that are even and numbers that are odd. [3]

*Ans.* newEven=[ ]  
 newOdd=[ ]  
 i=j=0  
 def parser(L):  
     for num in L:  
         if num%2 ==0:  
             newEven[i]=num  
             i+=1  
         else:  
             newOdd[j]=num  
             j+=1  
     print("Even number list : ", newEven)  
     print("Odd number list : ", newOdd)

30. Consider the following stack of characters, where STACK is allocated N = 8 memory cells.

STACK : A, C, D, F, K, ..., ..., ...

[3]

Describe the STACK at the end of the following operations. Here, Pop and Push are algorithms for deleting and adding an element to the stack.

- (i) Pop (STACK, ITEM)
- (ii) Pop (STACK, ITEM)
- (iii) Push (STACK, L)
- (iv) Push (STACK, P)
- (v) Pop (STACK, ITEM)
- (vi) Push (STACK, R)
- (vii) Push (STACK, S)
- (viii) Pop (STACK, ITEM)

*Ans.* The stack contents will be as follows after the operations of stack :

- |   |  |
|---|--|
| (i) STACK : A, C, D, F<br>(K is deleted)          | (ii) STACK : A, C, D, D<br>(F is deleted)      |
| (iii) STACK : A, C, D, L<br>(L is inserted)       | (iv) STACK : A, C, D, L, P<br>(P is inserted)  |
| (v) STACK : A, C, D, L<br>(P is deleted)          | (vi) STACK : A, C, D, L, R<br>(R is inserted)  |
| (vii) STACK : A, C, D, L, R, S<br>(S is inserted) | (viii) STACK : A, C, D, L, R<br>(S is deleted) |

Or

Consider the following sequence of numbers:

1, 2, 3, 4

These are supposed to be operated through a stack to produce the following sequence of numbers:

2, 1, 4, 3

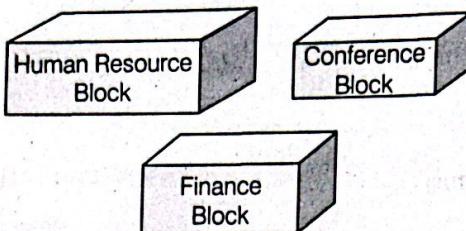
List the Push and Pop operations to get the required output.

- Ans.* (i) Push (1)  
 (ii) Push (2)  
 (iii) Pop (2)  
 (iv) Pop (1)  
 (v) Push (3)  
 (vi) Push (4)  
 (vii) Pop (4)  
 (viii) Pop (3)

## Section-D

31. Trine Tech Corporation (TTC) is a professional consultancy company. The company is planning up their new offices in India with its hub at Hyderabad. As a network adviser, you have to understand their requirement and suggest them the best available solutions. Their queries are mentioned below.

### Physical locations of the blocks of TTC



### Block to block distance (in m)

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

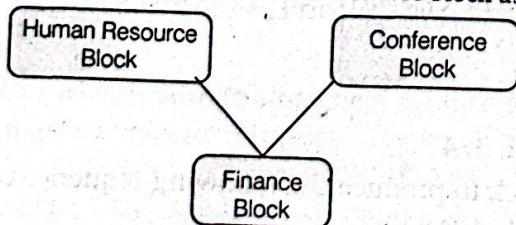
### Expected number of computers to be in each block

Block	Computers
Human Resource	25
Finance	120
Conference	90

- Which will be the most appropriate block, where TTC should plan to install their server?
- Draw a block to block cable layout to connect all the buildings in the most appropriate for efficient communication.
- Suggest a suitable topology to connect the computers in each building.
- Which of the following device will be suggested by you to connect each computer in each buildings?
  - Switch/Hub
  - Modem
  - Gateway
- Company is planning to connect its offices in Hyderabad which is less than 1 km. Which network will be formed?

**Ans.** (i) TTC should install its server in finance block as it is having maximum number of computers.

(ii)



The above layout is based on minimum cable length required, which is 120 m in the above case.

- Star topology, as it has independent connections that help easy network setup and fault detection.
- (a) Switch/Hub These are devices that can connect multiple nodes in a network, together.
- Since, the distance is less than 1km.  
LAN (Local Area Network) will be formed.

32. (a) What will be the output of the following code? [2+3]

```

value = 50
def display(N):
    global value
    value = 25
    if N%7==0:
        value = value + N
    else:
        value = value - N
    print(value, end="#")
display(20)
print(value)

```

- (b) Given below is a table Item in database Inventory.

ItemID	ItemName	Quantity	UnitPrice
101	ABC	5	120
102	XYZ	7	70
103	PQR	8	65
104	XYZ	12	55

Riya created this table but forgot to add column ManufacturingDate. Can she add this column after creation of table? If yes, write the code where user's name and password are system and test respectively.

Note the following to establish the connection between Python and MySQL:

Host : localhost

Username : system

Password : test

Database : Inventory

Ans. (a) 50#5

(b) Yes, she can add new column after creation of table.

```

import mysql.connector
mycon = mysql.connector.connect(
    host = "localhost",
    user = "system",
    passwd = "test",
    database = "Inventory")
cursor = mycon.cursor()
cursor.execute ("ALTER TABLE Item ADD ManufacturingDate Date NOT NULL")
mycon.close()

```

Or

- (a) Find the output of the following code :

```

Name="PythoN3@1"
R=""
for x in range(len(Name)):
    if Name[x].isupper():
        R=R+Name[x].lower()
    elif Name[x].islower():
        R=R+Name[x].upper()
    elif Name[x].isdigit():
        R=R+Name[x-1]
    else:
        R=R+"#"
print(R)

```

(b) Consider the following table structure

**Table: Faculty**

F\_ID(P)  
Fname  
Lname  
Hire\_date  
Salary.

Write the Python code to create the above table.

**Consider :**

host : localhost  
UserName : root  
Password : system  
Database :School

**Ans. (a) pYTHON#@**

```
(b) import mysql.connector
mycon = mysql.connector.connect (
    host = "localhost",
    user = "root",
    passwd = "system",
    database = "School")
cursor = mycon.cursor ()
db = cursor.execute ("CREATE TABLE Faculty (
    F_ID varchar (3) Primary key,
    Fname varchar (30) NOT NULL,
    Lname varchar (40),
    Hire_date Date,
    Salary  Float)")
mycon.close ()
```

**33. What do you mean by file? What do you mean by file handling?**

Write a program code in python to perform the following using two functions as follows :  
 (a) addBook() : to write to a csv file "book.csv" file book no, book name and no of pages separator as tab.

(b) countRecords() : To count and display the total number of records in the "book.csv" file

**Ans.** • The file refers to the collection of bytes stored in computer storage.  
 • File handling refers to the process of handling data using software for I/O operations.

**Program:**

```
import csv
def addBook():
    f1 = open("book.csv", 'w', newline = "\n")
    w1 = csv.writer(f1, delimiter = "\t")
    w1.writerow(['BookNo', 'BookName', 'Pages'])
    while True:
        op = int(input("Enter 1 to add and 0 to exit"))
        if(op == 1):
            Bookno = int(input("Enter Book No: "))
            Bookname = input("Enter Book Name: ")
            Pages = int(input("Enter Pages: "))
```

```
w1.writerow([Bookno, Bookname, Pages])
elif op == 0:
    break
f1.close()
def countRecords():
    f = open("book.csv", "r")
    d = csv.reader(f)
    next(f) #to skip header row
    r = 0
    for row in d:
        r = r+1
    print("Number of records are ", r)
    f.close()

addBook()
countRecords()
```

Or

Explain open() function with its syntax.

Write python code to perform the following using two user defined functions:

(a) showData(): To display only roll no and student name of the file "student.csv"

RollNo,	Name,	Marks
---------	-------	-------

1,	Nilesh,	65
----	---------	----

2,	Akshay,	75
----	---------	----

(b) showSelect(): To display only roll number and marks of the students from the csv file "student.csv"

**Ans.** • The open function has the following syntax:

- Syntax: <file object> = open(file\_name,access\_mode)
- file object : It is just like a variable or an object
- open(): It is a function with two parameters.
- file\_name: It accepts a file name with .txt extension.
- access\_mode: It specifies the mode to access the file. The default mode is reading mode.

**Program:**

```
import csv
def showData():
    f = open("student.csv", 'r')
    r = csv.reader(f, delimiter = ',')
    for row in r:
        print(row[0], row[1])
    f.close()
def showSelect():
    f = open("student.csv", 'r')
    r = csv.reader(f, delimiter = ',')
    for row in r:
        print(row[0], row[2])
    f.close()
showData()
showSelect()
```

# Section - E

**34.** Consider the following table STORE and answer the questions:

**TABLE: STORE**

ItemNo	Item	Scode	Qty	Rate	LastBuy
2005	Sharpener Classic	23	60	8	31-JUN-09
2003	Balls	22	50	25	01-FEB-10
2002	Gel Pen Premium	21	150	12	24-FEB-10
2006	Gel Pen Classic	21	250	20	11-MAR-09
2001	Eraser Small	22	220	6	19-JAN-09
2004	Eraser Big	22	110	8	02-DEC-09
2009	Ball Pen 0.5	21	180	18	03-NOV-09

- (i) What is the degree of the table?
- (ii) Write the syntax of the SQL command to change data of the table.
- (iii) Write statements to :
  - (a) Display the number of distinct Scodes.
  - (b) Display the maximum and minimum quantities.

*Or (Option for part (iii) only)*

Write statements to :

- (a) Display the structure of the STORE table.
  - (b) Add a new column Location varchar(50) in the table to store the location details of the items.
- Ans.** (i) Degree means the number of columns in a table. The degree of the table is 6.  
 (ii) Update <Table> Set <Column> = <Value/Expression> where <Condition>;  
 (iii) (a) `SELECT COUNT(DISTINCT Scode) FROM STORE;`  
      (b) `SELECT MAX(Qty) , MIN(Qty) FROM STORE;`
- Or*
- (a) `DESCRIBE STORE;`
  - (b) `ALTER TABLE STORE ADD Location varchar(50);`

- 35.** Given below is a code to open a text file "para.txt" and display the lines that begin with "myf=open(....., ..... ) Blank 1 , Blank 2  
 lines=myf. .... Blank 3  
 for ln in ..... : Blank 4  
 if ln[0]=="A":  
 print(ln)
- (i) Write the missing code for Blank 1 .
  - (ii) Write the missing code for Blank 2 .
  - (iii) Write the missing code for Blank 3 and Blank 4 .

**Ans.** (i) "para.txt"  
 (ii) "r"  
 (iii) `readlines(), lines.`