MODEL PAPER-2

SUBJECT - COMPUTER SCIENCE

CLASS-XII

MM-70 **TIME-3HRS**

General Instructions:

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 has 2 sections:
   a. Section – I is short answer questions, to be answered in one word or one line.
   b. Section – II has two case studies questions. Each case study has 4 case-based sub-parts.
   An examinee is to attempt any 4 out of the 5 subparts.
4. Part - B is Descriptive Paper.
5. Part- B has three sections
   a. Section-I is short answer questions of 2 marks each in which two question have internal options.
   b. Section-II is long answer questions of 3marks each in which two questions have internal options.
   c. Section-III is very long answer questions of 5 marks each in which one question has internal option.
6. All programming questions are to be answered using Python Language only

Question No.	**Part-A**	**Marks allocated**

Section-I

Select the most appropriate option out of the options given for each question. Attempt any 15 questions from question no 1 to 21.

1. Which operator is overloaded by the or() function? **[1]**
(A) || (B) | (C) // (D) /

2. Which function overloads the >> operator? **[1]**
(A) more() (B) gt() (C) ge() (D) None of the above

3. What will be the output of the following code : **[1]**
```
print type(type(int))
```
(A) type 'int' (B) type 'type' (C) Error (D) 0

4. What is the output of the following program : **[1]**
```
i = 0
while i < 3:
    print i
    i++
    print i+1
```
(A) 0 2 1 3 2 4 (B) 0 1 2 3 4 5 (C) Error (D) 1 0 2 4 3 5

5. What is called when a function is defined inside a class? **[1]**
(A) Module (B) Class
(C) Another Function (D) Method

6. Given a function that does not return any value, what value is shown when executed at the shell?
(A) int (B) bool (C) void (D) None **[1]**

7. Which of the following is not a complex number? **[1]**

(A) k = 2 + 3j (B) k = complex(2, 3) (C) k = 2 + 3l (D) k = 2 + 3J

8. What is the output of the following program : **[1]**

```
y = 8
z = lambda x : x * y
print z(6)
```

(A) 48 (B) 14 (C) 64 (D) None of the above

9. What is the output of the following program : **[1]**

```
import re
sentence = 'horses are fast'
regex = re.compile('(?P<animal>\w+) (?P<verb>\w+) (?P<adjective>\w+)')
matched = re.search(regex, sentence)
print(matched.groupdict())
```

(A) {'animal': 'horses', 'verb': 'are', 'adjective': 'fast'}

(B) ('horses', 'are', 'fast')

(C) 'horses are fast'

(D) 'are'

10. What possible outputs are expected to be displayed on the screen at the time of execution of the program from the following code? Also specify the minimum and maximum values that can be assigned to the variable c. **[1]**

```
import random temp=[10,20,30,40,50,60] c=random.randint(0,4) for i in range(0, c):
print(temp[i],"#")
```

(i)10#20# (ii) 10#20#30#40#50# (iii) 10#20#30# (iv) 50#60#

11. Python case sensitive when dealing with identifiers. **[1]**

(a) yes (b) no

(c) machine dependent (d) none of the mentioned

12. Which of the following is an invalid variable ? **[1]**

(a) my_day_2 (b) 2^{nd}_day (c) Day_two (d) _2

13. Which of the following id not keyword ? **[1]**

(a)eval (b) assert (c) nonlocal (d) pass

14. Which of the following is an invalid statement ? **[1]**

(a) abc=1,000,000 (b) a b c= 1000 2000 3000

(c) a,b,c =1000,2000,3000 (d) a=b=c =1,000,000

15. Which of the following cannot be variable ? **[1]**

(a) _init_ (b) in (c) it (d) on

16. Which of these is not a core data type.? **[1]**

(a) Lists (b) Dictionary (c) Tuples (d) Class

17. Given a function that does not return any value ,what value is thrown by default when executed in shell? **[1]**

(a) int (b) bool (c) void (d) none

18. Following set of commands is executed in shell ,what will be the output? **[1]**

```
>>>str ="hello"
>>>str [:2]
>>>
```

(a) he (b) lo (c) olleh (d) hello

19. Carefully observe the code and give the answer . **[1]**

```
def function1(a):
  a=a+'1'
    a=a*2
>>>function1("hello")
```

(a) indentation Error (b) cannot perform mathematical operation on strings

(c) hello2 (d) hello2 hello2

20. What data type is the object below? **[1]**

L= [1,23,'hello',1]

(a) list (b) dictionary (c) array (d) tuple

21. To store values in terms of key and value, what core data type does Python Provide ? **[1]**

(a) list (b) tuple (c) class (d) dictionary

Section-II

Both the Case study based questions are compulsory. Attempt any 4 sub parts from each question. Each question carries 1 mark

22. Write SQL queries for (a) to (f) and write the outputs for (g) parts (i) to (iv) on the basis of tables APPLICANTS and COURSES.

TABLE: APPLICANTS

No.	NAME	FEE	GENDER	C_ID	JOINYEAR
1012	Amandeep	30000	M	A01	2012
1102	Avisha	25000	F	A02	2009
1103	Ekant	30000	M	A02	2011
1049	Arun	30000	M	A03	2009
1025	Amber	40000	M	A02	2011
1106	Ela	40000	F	A05	2010
1017	Nikita	35000	F	A03	2012
1108	Arluna	30000	F	A03	2012
2109	Shakti	35000	M	A04	2011
1101	Kirat	25000	M	A01	2012

TABLE: COURSES

C_ID	COURSE
A01	FASHION DESIGN
A02	NETWORKING
A03	HOTEL MANAGEMENT
A04	EVENT MANAGEMENT
A05	OFFICE MANAGEMENT

(a) To display NAME, FEE, GENDER, JOINYEAR about the APPLICANTS, who have joined before 2010.

(b) To display the names of applicants, who are paying FEE more than 30000.

(c) To display the names of all applicants in ascending order of their join year.

(d) To display the year and the total number of applicants joined in each year from the table APPLICANTS.

(e) To display the CJD and the number of applicants registered in the course from the APPLICANTS table.
(f) To display the applicant's name with their respective course's name from the tables APPLICANTS and COURSES.
(g) Give the output of the following SQL statements:
(i) SELECT NAME, JOINYEAR FROM APPLICANTS WHERE GENDER =' F' AND C_ID= ' A02 ' ;
(ii) SELECT MIN (JOI NYEAR) FROM APPLICANTS WHERE GENDER = ' M' ;
(iii) SELECT AVG(FEE) FROM APPLICANTS WHERE C_ID='A01 ' OR C_ID='A05';
(iv) SELECT SUM(FEE), C_ID FROM APPLICANTS GROUP BY C_ID HAVING C0UNT(*)=2;

24. Consider the following tables CARDEN and CUSTOMER and answer (a) and (b) parts of this questions:

TABLE: CAKDKN

Ccode	CarName	Make	Color	Capacity	Charges
501	A-star	Suzuki	RED	3	14
503	Indigo	Tata	SILVER	3	12
502	Innova	Toyota	WHITE	7	15
509	SX4	Suzuki	SILVER	4	14
510	C-Class	Mercedes	RED	4	35

TABLE: Customer

CCode	CName	Ccode
1001	Hamant Sahu	501
1002	Raj Lai	509
1003	Feroza Shah	503
1004	Ketan Dhal	502

(a) Write SQL commands for the following statements:
(i) To display the name of all the SILVER colored cars.
(ii) To display name of Car, Make and sitting Capacity of cars in descending order of their sitting Capacity.
(iii) To display the highest Charges at which a vehicle can be hired from CARDEN.
(iv) To display the Customer name and the corresponding name of the Cars hired by them.

(b) Give the output of the following SQL queries:
(i) SELECT COUNT(DISTINCT Make) FROM CARDEN;
(ii) SELECT MAX(Charges), MIN (Charges) FROM CARDEN;
(iii) SELECT COUNT(*) Make FROM CARDEN;
(iv) SELECT CarName FROM CARDEN WHERE Capacity = 4;

PART-B

SECTION-1

24. How are floating constants represented in Python? Give example . **[2]**

25. How are string –literals represented and implemented in Python? **[2]**

26. What all components can a Python program contain ? **[2]**

27. Which names are local and which are global in the following code fragment. **[2]**

```
invaders = " Big names "
  pos = 200
  level = 1
def play ( ) :
      max_ level = level + 10
      print ( len ( invaders ) == 0 )
      return max_level
  res = play ( )
   print ( res )
```

28. What is the internal structure of Python strings ? **[2]**

29. What are data types? What are python's built –in core data types? **[2]**

30. What is the role of comments and indentation in a program ? **[2]**

31. Fill in the blanks : **[2]**

(a) The_____computer is used to serve data and information

(b) _____is a set of rules that governs the communications between computers on a network.

(c)_____is a device software or a system that converts data between dissimilar network with different protocols.

(d) _____ is an interconnection of several computers of different types belonging to various network all over the world .

32. Give the full forms of the following **[2]**

ARPAnet-
FTP -
WWW-
DNS-
RJ-45-
GSM -
SMTP-
POP-

33. How is co-axial cable different from optical fibre? **[2]**

Section- II

34. What do you understand by local and global scope of variables? **[3]**

OR

Write a program to input n numbers and to insert any number in a particular position.

35. Convert the following for loop into while loop, for i in range (1,100): **[3]**

```
if i % 4 == 2 :
 print i, "mod", 4 , "= 2"
```

36. What is the difference between parameters and arguments? **[3]**

37. Explain Relational Database Terms? **[3]**

[5]

Section-III

38. Granuda consultants are setting up a secured network for their office campus at Farida bad for their day-to-day office and web based activities. They are planning to have connectivity between 3 buildings and the head office situated in Kolkata. Answer the questions (i) to (iv) after going through the building positions in the campus and other details, which are given below. **[5]**

Distance between various buildings

Building RAVI to Building JAMUNA	120 m
Building RAVI to Building GANGA	50 m
Building GANGA to Building JAMUNA	65 m
Faridabad Campus to Head Office	1460 km

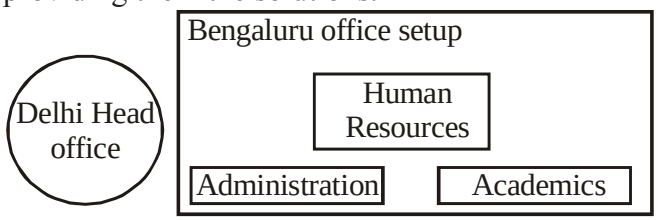
Number of computers	
Building RAVI	25
Building JAMUNA	150
Building GANGA	51
Head Office	10

Suggest the most suitable place (i.e. block) to house the server of this organisation. Also, give a reason to justify your suggested location.

1. Suggest a cable layout of connections between the building inside the campus.
2. Suggest the placement of the following devices with justification:
   (a) Switch (b) Repeater
3. The organisation is planning to provide a high speed link with its head office situated in the Kolkata using a wired connection. Which of the following cable will be most suitable for this job?
   (a) Optical fibre (b) Co-axial cable (c) Ethernet cable

OR

G.R.K International Inc. is planning to connect its Bengaluru Office Setup with its Head Office in Delhi. The Bengaluru Office G.R.K. International Inc. is spread across an area of approx. 1 square kilometres consisting of 3 blocks. Human Resources, Academics and Administration. You as a network expert have to suggest answers to the four queries (i) to (iv) raised by them. Note Keep the distances between blocks and number of computers in each block in mind, while providing them the solutions.



Shortest distances between various blocks

Human Resources to Administration	100m
Human Resources to Academics	65m
Academics to Administration	110m
Delhi Head Office to Bengaluru Office Setup	2350 km

Number of computers installed at various blocks

Block	Number of computers
Human Resources	155
Administration	20
Academics	100
Delhi Head Office	20

1. Suggest the most suitable block in the Bengaluru Office Setup to host the server. Give a suitable reason with your suggestion.
2. Suggest the cable layout among the various blocks within the Bengaluru Office Setup for connecting the blocks.
3. Suggest a suitable networking device to be installed In each of the blocks essentially required for connecting computers inside the blocks with fast and efficient connectivity.
4. Suggest the most suitable media to provide secure, fast and reliable data connectivity between Delhi Head Office and the Bengaluru Office Setup.

39. Answer the questions (a) and (b) on the basis of the following tables SHOPPE and ACCESSORIES. **[5]**

TABLE: SHOPPK

Id	SName	Area
S001	ABC Computeronics	CP
S002	All Infotech Media	GKII
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

(a) 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 Shoppe located 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.

(b) Write the output of the following SQL commands:

(i) SELECT DISTINCT NAME FROM ACCESSORIES WHERE PRICE>=5000;

(ii) SELECT AREA, COUNT(*) FROM SHOPPE GROUP BY AREA;

(iii) SELECT COUNT (DI ST INCT AREA) FROM SHOPPE:

(iv) SELECT NAME, PRICE*0.05 DISCOUNT FROM ACCESSORIES WHERE SNO IN ('S02'.'S03');

40. What are MySQL feature? **[5]**

Solution : Paper-2

Section-A

1. (B)
Explanation: or() function overloads the bitwise OR operator

2. (D)
Explanation: rshift() overloads the >> operator

3. (B)
Explanation: The type() function returns the class of the argument the object belongs to. Thus, type(int) returns which is of the type 'type' object.

4. (C)
Explanation: There is no operator ++ in Python

5. (D)

6. (D)
Explanation: Python explicitly defines the None object that is returned if no value is specified.

7. (C)

8. (A)
Explanation: lambdas are concise functions and thus, result = 6 * 8

9. (A)
Explanation: This function returns a dictionary that contains all the matches.

10. (i) & (iii) Minimum value of C is 0 and Maximum value is 3

11. (a)

12. (b)

13. (a)

14. (b)

15. (b)

16. (d)

17. (d)

18. (a)

19. (a)

20. (a)

21. (d)

22. (a) SELECT NAME, FEE, GENDER, JOINYEAR FROM APPLICANTS WHERE JOINYEAR<2010;
(b) SELECT NAME FROM APPLICANTS WHERE FEE>30000;
(c) SELECT NAME FROM APPLICANTS ORDER BY JOINYEAR;
(d) SELECT JOINYEAR, COUNT!*) FROM APPLICANTS GROUP BY JOINYEAR;
(e) SELECT C_ID, COUNT(*) FROM APPLICANTS GROUP BY C_ID;
(f) SELECT NAME, COURSE FROM APPLICANTS, COURSES WHERE APPLICANTS.C_ID =COURSES.C_ID;
(g) (i) NAME JOINYEAR
Avisha 2009
(ii) MIN (JOINYEAR)
2009
(iii) AVG (FEE)
31666.666
(iv) SUM(FEE) CJD
55000 A01

23. (a) (i) SELECT CarName FROM CARDEN WHERE Col or=' SILVER' ;
(ii) SELECT CarName, Make, Capacity FROM CARDEN ORDER BY Capacity DESC;
(iii) SELECT MAX(Charges) FROM CARDEN;
(iv) SELECT CUSTOMER.CName, CARDEN.CarName FROM CARDEN, CUSTOMER WHERE CARDEN.Ccode=CUSTOMER.Ccode;

(b) (i)

COUNT (DISTINCT Make)
4

(ii)

MAX (Charges)	MIN (Charges)
35	12

(iii)

Make(*)
5

(iv)

CarName
SX4
C-Class

Section-B

24. Floating point literals or real literals or floats represent real numbers and are written with a decimal point dividing the integer and fractional parts to represent numbers having fractional parts.
These can be written either in :
Fractional form e.g -13.0 ,.75,7. etc
Exponent form e.g 0.17E5 ,3.E2, .6E4 etc

25. A string literal is a sequence of characters surrounded by quotes(single or double or triple quotes) String literals can either be single line strings or multi line strings.

26. A Python program contains various components such as
Expressions, Statements, Comments, Functions, Block(s) or suite(s) etc

27. Global names : invaders , pos ,level ,res
Local names : max_level

28. Strings in Python are stored as individual characters in contiguous locations ,with two way index for each location.

29. The real life data is of many types .so to represent various types of real-life data programming languages provide ways and facilities to handle these, which are known as data types. Python Built –in core data types belong to:
1.Numbers (integers, floating –point ,complex numbers, booleans)
2. String 3. List 4. Tuple 5.Dictionary

30. Comments provide explanatory notes to the readers of the program. Compiler of interpreter ignores the comments but they are useful for specifying additional descriptive information regarding the code and logic of the program
Indentation makes the program more readable and presentable .Its main role is to highlight nesting of groups of control statements

31. (a) server
(b) Protocol
(c) Gateway
(d) Internet

32. Advanced Research Project Agency Network
File Transfer Protocol
World Wide Web
Domain Name System
Registered Jack-45
Global system for mobile communication
Simple Mail Transfer Protocol
Post Office Protocol

33. The data transmission characteristics of co-axial cable are considerably better than twisted pair but not better in relation to optical fibre. The co-axial cable is being used as a shared cable network, with part of the bandwidth being used for data traffic. Optical fibre is difficult to install because they are fragile and need special care to install. One of the major advantage of optical fibre over co-axial cable is its complete immunity to noise, because the information is travelled on a modulated light beam.

34. A global variable is a variable that is accessible globally. A local variable is one that is only accessible to the current scope ,such as temporary variables used in a single function definition. A variable declared outside of all the functions or in a global scope is known as global variable . A global variable can be accessed inside or outside of the function where as local variable can be used only inside the function, if a function has a local variable name as a global variable , then in that function scope, the local variable will be hide the global variable with the same name. We can access a global variable having the same name as a local variable by declaring its name with keyword global, e.g global A.

OR

```
n=input("Enter no. of values")
num=[]
for i in range (n):
number=input("Enter the number")        num.append(number)
newno = input("Enter the number to be inserted")
pos = input("Enter position") num.insert(newno,pos)
print (num)
```

35.
```
i=1
    while i < 100:
    if i % 4 == 2:
    print i, "mod", 4 , "= 2"
    i = i +1
```

36.

S.No.	Parameters	Arguments
1	Values provided in function header	Values provided in function call.
2	(eg) def area (r): → r is the parameter	(eg) def main() radius = 5.0 area (radius) → radius is the argument

37. RELATIONAL DATABASE TERMS

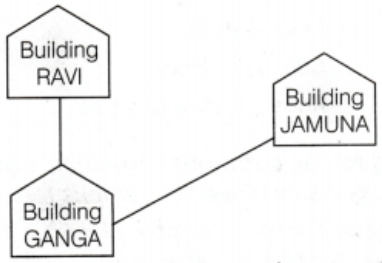
Relation (Table) A Relation or Table is Matrix like structure arranged in Rows and Columns. It has the following properties-

Atomicity : Each column assigned a unique name and must have atomic(indivisible) value i.e. a value that can not be further subdivided.

No duplicity: No two rows of relation will be identical i.e. in any two rows value in at least one column must be different. All items in a column are homogeneous i.e.same data type.
Ordering of rows and column is immaterial.
Domain :It is collection of values from which the value is derived for a column.
Tuple / Entity / Record - Rows of a table is called Tuple or Record.
Attribute/ Field- Column of a table is called Attribute or Field.
Degree - Number of columns (attributes) in a table.
Cardinality - Number of rows (Records) in a table

38. 1. The most suitable place to house the server in JAMUNA because it has maximum number of computers.

2.



3. (a) Switches are needed in every building to share bandwidth in every building.

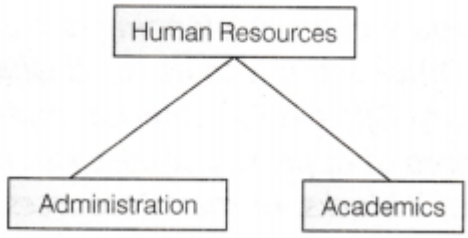
(b) Repeaters may be skipped as per above layout, (because distance is less than 100 m) however, if building RAVI and building JAMUNA are directly connected, we can place a repeater there as the distance between these two buildings is more than 100 m.

4. (b) Co-axial cable.

OR

1. Human Resources, because it has maximum number of computers.

2.



3. Hub/Switch.

4. Satellite.

39. (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) (i)

NAME
Mother Board
Hard Disk
LCD

(ii)

AREA	COUNT(*)
GK II	1
Nehru Place	2
CP	2

(iii)

COUNT (DISTINCTAREA)
3

(iv) The given query will result in an error as there is no column named SNo in ACCESSORIES table.

40. MySQL Features

Open Source & Free of Cost:It is Open Source and available at free of cost.

Portability:Small enough in size to instal and run it on any types of Hardware and OS like Linux,MS Windows or Mac etc.

Security :Its Databases are secured & protected with password.

Connectivity :Various APIs are developed to connect it with many programming languages.

Query Language:It supports SQL (Structured Query Language) for handling database