

SAMPLE QUESTION PAPER 1
CLASS XII
COMPUTER SCIENCE (083)
TERM II

Maximum Marks: 35

Time Allowed: 2 Hours

General Instructions:

1. The question paper is divided into 3 sections – A, B and C.
2. Section A consists of 7 questions (1–7). Each question carries 2 marks.
3. Section B consists of 3 questions (8–10). Each question carries 3 marks.
4. Section C consists of 3 questions (11–13). Each question carries 4 marks.
5. Internal choices have been given for question numbers 1, 3, 8 and 12.

Section A

Each question carries 2 marks

1. What is a stack? Write two operations that can be performed on the stack. 2

Ans. A stack is a basic data structure that follows the Last In First Out (LIFO) principle where insertion and deletion of data take place at one end called the top of the stack. The two operations that can be performed on the stack are:

- (i) PUSH – to insert an element
- (ii) POP – to delete an element from the stack.

2. (i) Expand the following terms: 1
VoIP, NIC

Ans. VoIP: Voice over Internet Protocol

NIC: Network Interface Card

- (ii) Which device is used to regenerate the weak signals for long-distance transmission? 1

Ans. Repeater

3. Consider a table 'Online_Class' with the following structure: 2

Meeting_Id	Date_of_Class	Student_Name	Charges
121100991	2022-01-12	Kavya Sethi	500.00

- (i) Identify the data types of Date_of_Class and Charges columns.
- (ii) If a column 'passcode' contains only 4 letters password information like '1#a4' then out of char or varchar, which data type is suitable for this column. Justify your answer.

Ans. (i) Date_of_Class – Date
Charges – Decimal

- (ii) We can use char (4) data type for the passcode column because the values in a column are of same length.

4. What are the different parameters in connect() function of mysql.connector? 2

Ans. There are four parameters in connect() function:

- (i) host – It is the username on MySQL.
- (ii) password – It is the password of the user in MySQL.
- (iii) hostname – It is the hostname of the database server.
- (iv) database – It is the database name of the MySQL database.



5. Write the output of the queries (i) to (iv) based on the table Product given below:

2

PId	P_Name	P_Price	P_Qty	Date_Of_Purchase
P001	Keyboard	800	3	2022-01-01
P002	Mouse	380	6	2021-12-23
P003	Speaker	1800	3	2022-01-01
P004	Headphone	1000	6	2021-10-02
P005	Stylus	3000	2	2022-01-19

- (i) Select P_Name, P_Price from Product Where P_Price>1500;
 (ii) Select PId, P_Name, P_Price * P_Qty from Product Where P_Name Like '%e';
 (iii) Select Max(Date_Of_Purchase) from Product Where P_Price>500;
 (iv) Select Sum(P_Price) from Product Where P_Price * P_Qty >3000;

Ans. (i)

P_Name	Price
Speaker	1800
Stylus	3000

(ii)

PID	P_Name	P_Price * P_Qty
P002	Mouse	2280
P004	Headphone	6000

(iii)

Max(Date_Of_Purchase)
2022-01-19

(iv)

Sum(P_Price)
5800

6. (i) Which command is used to create a database in SQL?

1

Ans. create database <database_name>;

(ii) How will you calculate columns and rows in a cross join?

1

Ans. The total number of columns in the resultant table is the sum of the number of columns and the total number of rows is the product of the number of rows in all tables.

7. Consider the table Employee with the following records:

2

Emp_ID	Emp_Name	Designation	Salary	Date_of_Joining
E101	Kanishk Arya	Manager	80000	2010-09-01
E102	Shuchi Sharma	Marketing Head	75000	2012-10-10
E103	Simran Gupta	Accounts Head	72000	2015-03-05
E104	Deepak Malhotra	Sales Head	55000	2018-02-09

(i) What could be the possible reason when inserting a new row using the following command gives an error? Justify your answer.

```
Insert Into Employee Values('E104', 'Jai Gupta', 'Manager', 80000, '2020-12-10');
```

(ii) What would be the cardinality and degree of the table when 3 more rows are added to the table?

OR

Consider the table PF_Details and answer the following questions:

PF_No	Date_of_Birth	email-id	Emp_ID
12255	1990-09-09	ka200@gmail.com	E101
13366	1991-10-08	shuch100@gmail.com	E102
11188	1994-01-02	simran2000@yahoo.com	E103
55599	1997-02-09	Deepak_500@gmail.com	E104

- (i) Identify the Primary and Foreign keys of table PF_Details if the Employee table given above is linked to this table.
- (ii) Can we delete the record of any employee from the table PF_Details?
- Ans. (i) Inserting a new row in the table Employee gives an error because we are trying to insert a duplicate value 'E104' in the column Emp_ID that is already present in the table and Emp_ID is the primary key of the table that cannot accept duplicate value for this column.
- (ii) Cardinality -7
Degree - 5

OR

- (i) The Primary key of the table PF_Details is PF_No and the Foreign key is Emp_ID.
- (ii) No, we cannot delete the record of any employee from the table because of referential integrity. In table PF_Details, the column Emp_ID is the Foreign key which is linked to the table Employee that rejects the deletion operation in the PF_Details table.

Section – B

Each question carries 3 marks

8. Pankaj has to create a record of books containing BookNo, BookName and BookPrice. Write a user-defined function to create a stack and perform the following operations: 3
- Input the Book No, BookName and BookPrice from the user and Push into the stack.
 - Display the status of stack after each insertion.

OR

Write a function in Python PUSH(Arr), where Arr is a list of numbers. From this list push all numbers divisible by 3 into a stack implemented using a list. Display the stack if it has at least one element, otherwise display appropriate error message.

Ans.

```
def Book(st):
    bookid=input('Enter Book id')
    bookname=input('Enter book name')
    bookPrice=int(input('Enter book Price'))
    st.append([bookid,bookname,bookPrice])
    i=len(st)-1
    while i>0:
        print(st[i])
        i-=1
```

OR

Ans.

```
def PUSH(Arr):
    s=[]
    for x in range(0,len(Arr)):
        if Arr[x]%3==0:
            s.append(Arr[x])
            if len(s)==0:
                print("Empty Stack")
            else:
                print(s)
```



9. (i) A table Voter_list is created with the following columns: 1

V_ID, V_Name, V_Address, V_Age, V_AreaCode, V_Gender, V_Phone_No

Write an SQL command to delete column V_Phone_No from the table Voter_list.

Ans. Alter Table Voter_list

Drop V_Phone_No;

- (ii) Differentiate between Alter and Update commands with the help of examples. 2

Ans.

Alter Command		Update Command	
(i)	It is used to change the columns of the existing table such as: adding a new column, deleting a column, renaming a column name and changing the data type of the column.	(i)	It is used to change the records of the table specified by a condition.
(ii)	It is a DDL command.	(ii)	It is a DML command.
(iii)	For example, to add a new column in a table, Alter table student Add Contact_No Varchar (20);	(iii)	For example, to change the records of student Update Student Set Marks=Marks+5;

10. Rashmi has to create a table in SQL to store the records of students and their projects submission information. The structure of the table Project_Info is: 3

Table: Project_Info

Field Name	Data Type	Size	Remarks
Stud_Roll_No	Integer	8	
Name	Varchar	30	NOT NULL
Project_Name	Varchar	35	
No_of_Students	Integer	3	

Help Rashmi to complete the following tasks:

- (i) To create the table Project_Info.

- (ii) She has forgotten to add the Primary key to this table. Write a command to add Primary key to column Stud_Roll_No.

Ans. (ii) Create Table Project_Info(

```
Stud_Roll_No integer(8),
Name varchar(30) NOT NULL,
Project_Name varchar(35),
No_of_Students integer(3));
```

- (ii) Alter Table Project_Info

```
Add Primary Key(Stud_Roll_No);
```

Section C

Each question carries 4 marks

11. Consider the following tables Activity and Coach. Write SQL commands for the statements (i) to (iv). 4

Table : Activity

ACode	Activity_Name	Participant_Num	Prize_Money	Scheduled_date
1001	Relay 100x 4	16	10000	2022-01-23
1002	High Jump	10	12000	2022-01-24
1003	Shot Put	12	8000	2022-01-25
1005	Long Jump	12	9000	2022-01-27
1008	Discus Throw	10	15000	2022-01-29

Table: **Coach**

PCode	Name	ACode
1	Varun Kumar	1001
2	Sreeja Gupta	1008
3	Praveen Kumar	1001
4	Suman Kumari	1003

- (i) To display the name of all activities with their Acodes in descending order.
- (ii) To display the sum of PrizeMoney for each of the number of participants group-wise.
- (iii) To display the content of the Activity table where Scheduled_date is earlier than 2021-01-26 in ascending order of Participant_Num.
- (iv) To display Participant_Num from Activity table without repetition.

Ans. (i) `Select Activity_Name from Activity
Order by Acode Desc;`

(ii) `Select Sum(Prize_Money) from Activity
Group By Participant_Num ;`

(iii) `Select * from Activity
where Scheduled_Date < '2022-01-26'
Order By Participant_Num;`

(iv) `Select Distinct Participant_Num from Activity;`

- 12.** (i) Differentiate between Star topology and Bus topology.

2

OR

Define the following terms:

Web browser, Protocols

Ans.

Star topology	Bus topology
In star topology, a central hub is required to connect all computers with each other.	In a bus topology, a long cable is known as a backbone which is used to connect all computers with each other.
The data is transmitted from the sender to the receiver by passing through the hub.	The data is transmitted through a long cable from the sender to the receiver.
No collision takes place through transmission of data.	A collision can take place as the data can be transmitted from both ends at the same time.
If the central hub fails, the entire network shuts down.	If there is a break in a cable, no transmission takes place.

OR

Web Browser: A web browser is a software that is used for displaying the content on web page(s). It is used by the client to view websites. Examples of web browsers—Google Chrome, Firefox, Microsoft Edge, Safari, Opera, etc.

Protocol: A protocol means the rules that are applicable for a network, or a common set of rules used for communication in the network. Some of the examples of protocols are FTP, SMTP, TCP/IP, etc.

- (ii) Differentiate between Client-Server and Peer-to-Peer networks.

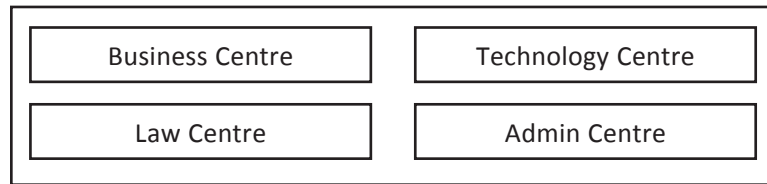
2

Client-Server networks: In Client-Server network, multiple clients, or workstations, are connected to at least one central server. A server is a powerful computer with all applications and hardware installed in it and a client is a computer which is seeking any resource from another computer. When clients need access to these resources, they access them from the server. This network is used for larger networks.

Peer-to-Peer networks: In Peer-to-Peer network, all nodes in the network have equivalent capability and function as both client and server. In this network, all workstations are connected together for sharing devices, information or data. This network is ideal for small networks where there is no need for dedicated servers.

13. Bright Study University is setting up its academic centres in Gurugram and planning to set up a network. The university has 3 academic centres and one administration centre as shown in the diagram given below:

4



Distance between various centres:

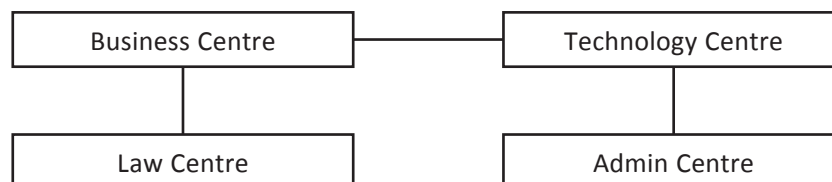
Business Centre	Law Centre	60 m
Law Centre	Technology Centre	90 m
Law Centre	Admin Centre	115 m
Business Centre	Technology Centre	40 m
Business Centre	Admin Centre	45 m
Technology Centre	Admin Centre	25 m

The number of computers in each block is as follows:

Business Centre	25
Technology Centre	55
Admin Centre	130
Law Centre	35

- Suggest and draw a cable layout to efficiently connect various centres within the university.
- Which device will you suggest to be placed/ installed in each of these centres to efficiently connect all the computers within the university?
- Name the centre where the server is to be installed. Justify your answer.
- The university is planning to connect its admin office in the closest big city, which is more than 350 km from the university. Which type of network out of LAN, MAN or WAN will be formed? Justify your answer.

Ans. (i) The most suitable cable layout is:



- Switch
- Admin Centre because Admin Centre has the maximum number of computers, or Business Centre because it is closest to all other centres (minimum cable length required).
- WAN is the preferred network for this purpose because 350 km is more than the range of LAN and MAN.

SAMPLE QUESTION PAPER 2

CLASS XII COMPUTER SCIENCE (083) TERM II

Maximum Marks: 35

Time Allowed: 2 Hours

General Instructions:

1. The question paper is divided into 3 sections – A, B and C.
2. Section A consists of 7 questions (1-7). Each question carries 2 marks.
3. Section B consists of 3 questions (8-10). Each question carries 3 marks.
4. Section C consists of 3 questions (11-13). Each question carries 4 marks.
5. Internal choices have been given for question numbers – 1, 3, 8 and 12.

Section A

1. Write the name of the operations that can be applied on stacks. Also write the name of functions that are used to perform the task. 2

Ans. In stack, inserting an element is known as Pushing which is done by `append()` function and deleting an element is known as Popping which is accomplished by `pop()` or `del` function.

2. (i) Expand the following terms: 1
MAC, TCP/IP

Ans. MAC: Media Access Control

TCP/IP: Transmission Control Protocol/Internet Protocol

- (ii) Which device is used to convert the analog signal into digital and vice versa? 1

Ans. MODEM (Modulator-Demodulator)

3. Differentiate between Primary and Foreign key. 2

Ans. Primary Key: A primary key is a set of one or more attributes/fields which uniquely identifies a tuple/row in a table. It does not allow duplicate values in a relation.

It cannot be re-declared or left null. One table can have only one primary key; however, primary key can be a combination of more than one field.

Foreign Key: A foreign key is a non-key attribute whose value is derived from the primary key of another table; in other words, a primary key in some other table having relationship with the current or original table.

4. Explain any two methods through which we can extract records from a resultset? 2

Ans. fetchone(): It fetches the next row from the active result set.

fetchall(): It fetches all the rows in a result set and returns a list of tuples. If some rows have already been extracted from the result set, then it retrieves the remaining rows. If no more rows are available, it returns an empty list.

5. Write the output of the queries (i) to (iv) based on the table Employee given below: 2

Ecode	Name	Salary	Job	City
E1	Ritu Jain	50000	Manager	Delhi
E2	Vikas Verma	45000	Executive	Jaipur
E3	Rajat Chaudhary	30000	Clerk	Delhi
E4	Leena Arora	45000	Manager	Bangalore
E5	Shikha Sharma	50000	Accountant	Kanpur

- (i) `Select Ecode, Name, Max(Salary) from Employee Where City='Delhi';`
 (ii) `Select Name, job from Employee Where Salary Between 40000 and 50000 ;`
 (iii) `Select AVG(Salary) from Employee Where Job In ('Manager', 'Executive', 'Clerk');`
 (iv) `Select Sum(Salary) from Employee Where Name Like '%a';`

Ans. (i)

Ecode	Name	Max(Salary)
E1	Ritu Jain	50000

(ii)

Name	Job
Ritu Jain	Manager
Vikas Verma	Executive
Leena Arora	Manager
Shika Sharma	Accountant

(iii)

AVG(Salary)
42500.0

(iv)

Sum(Salary)
140000

6. (i) Write a command to delete all rows from the table 'Student'.

1

Ans. `Delete from Student;`

- (ii) Which type of join is depicted in the following SQL statement?

1

```
Select P.PNo, P.Product_Name, Pr.P_Price
From Product P, Price Pr
Where P.PNo=Pr.PNo;
```

Ans. The join depicted in the SQL statement is equi join.

7. Consider the table Employee with the following records:

2

Table: Employee

ECODE	NAME	DESIG	SGRADE	DOJ	DOB
101	Sneha Bhardwaj	EXECUTIVE	S01	2003-03-23	1980-01-13
102	Ravi Chander	HEAD-IT	S02	2010-02-12	1987-07-22
103	Sunita Kumari	RECEPTIONIST	S03	2009-06-20	1983-02-24
108	Ravi Kumar	GM	S04	2006-08-11	1984-03-03
107	Priyam Sen	Head-IT	S05	2004-12-29	1984-03-03

- (i) In table Employee, identify which of the two columns are uniquely identified each row? Which key can be made with these columns?
 (ii) What is the cardinality and degree of the Employee table?

OR

Consider the table Salary and answer the following questions:

SNO	SGRADE	SALARY
1	S01	28000
2	S02	45000
3	S03	25000
4	S04	90000
5	S05	50000

- (i) How can we access records from both the tables Employee and Salary?
(ii) How many rows and columns will be there after the cartesian product of these two tables?
- Ans.** (i) In the table Employee, the columns which are uniquely identified and each row are ECODE and SGRADE. These columns can be made the Primary key of the table.
(ii) The cardinality of the table is 5 and the degree of the table is 6.

OR

- (i) We can access records from both tables by creating a Foreign key that can join both tables through common columns.
(ii) The rows will be $5 * 5 = 25$ and columns will be $6 + 3 = 9$ after the cartesian product of two tables.



Section – B

Each question carries 3 marks

8. Shruti has created a dictionary that stores Product names as key and price as values. Write a user-defined function to perform the following operations: 3
- Push the values into the stack if the price of products is greater than 100.
 - Pop and display the contents of the stack.

For example, if the content of the dictionary is as follows:

product={'Book':250, 'Pen':120, 'Pencil':50, 'Notebook':400, 'Register':480}

The elements of the stack should be:

[250, 120, 400, 480]

OR

Prateek has created a list arr with some elements. Help him to create a user-defined function to perform the following tasks:

- Create a stack after checking the elements if it is even then multiply by 2 and if the element is odd, then multiply it by 3.
- Pop and display the contents of the stack.

Sample Input Data of the list arr = [2,3,4,5,6,7,8,9,10]

Output stack: NewSt = [4, 9, 8, 15, 12, 21, 16, 27, 20]

Ans. product={'Book':250, 'Pen':120, 'Pencil':50, 'Notebook':400, 'Register':480}

```
def push(st,a):
    st.append(a)
    print(st)

def pop(st):
    if st==[]:
        print('Underflow')
    else:
        print(st.pop(0))

st=[]
for i,j in product.items():
    if j>100:
        push(st,j)

while True:
    if st!=[]:
        print(pop(st),end=" ")
    else:
        break
```

OR

```
Ans. def push(NewSt,arr):
    for i in arr:
        if i%2==0:
            NewSt.append(i*2)
        else:
            NewSt.append(i*3)
    print(NewSt)
def pop(st):
    if st==[]:
        print('Underflow')
    else:
        print(st.pop(0))
arr=[2,3,4,5,6,7,8,9,10]
NewSt=[]
push(NewSt,arr)
while True:
    if NewSt!=[]:
        print(pop(NewSt),end=" ")
    else:
        break
```

9. (i) A table Transport is created with the following columns: 1

Bus_No, Bus_route, Area, No_of_students, Helper_Name, Charges

Write an SQL command to increase the Bus charges by 12% for all students.

Ans. Update Transport

Set Charges = Charges*0.12;

- (ii) Identify the commands and categorize them into DDL and DDL commands. 2

(i) To add a new row into the table.

(ii) To modify the datatype of the column of a table.

Ans. (i) Insert Into command – DML command

(ii) Alter table Modify – DDL command

10. Ms Swati has created a database MySchool and wants to create a table in SQL to store the records of students. The structure of the table Student is given below: 3

Table: Student

ColumnName	Data type	size	Constraint
RollNo	Integer	4	Primary Key
Sname	Varchar	25	Not Null
Gender	Char	1	Not Null
DOB	Date		Not Null
Fees	Integer	4	Not Null
Hobby	Varchar	15	Null

- (i) Write SQL command to create table Student.
- (ii) Write SQL command to delete column Hobby.

Ans. (i) Create Table Student(
RollNo integer(4) Primary Key,
SName varchar(25) NOT NULL,
Gender char(1) NOT NULL,
DOB Date NOT NULL,
Fees integer(4) NOT NULL,
Hobby varchar(15) Null);
(ii) Alter Table Student
Drop Hobby;

SECTION C

Each question carries 4 marks

11. Consider the following tables Product and Client. Write SQL commands for the statements (i) to (iv). 4

Table: Product

P_ID	ProductName	Manufacturer	Price	Discount
TP01	Talcum Powder	LAK	40	NULL
FW05	Face Wash	ABC	45	5
BS01	Bath Soap	ABC	55	NULL
SH06	Shampoo	XYZ	120	10
FW12	Face Wash	XYZ	95	NULL

Table: Client

C_ID	ClientName	City	P_ID
01	Cosmetic Shop	Delhi	TP01
02	Total Health	Mumbai	FW05
03	Live Life	Delhi	BS01
04	Pretty Woman	Delhi	SH06
05	Dreams	Delhi	FW12

- (i) To display ProductName, Price and ClientName city-wise.
- (ii) To display the sum of the price of all products where there is no discount.
- (iii) To display the name of products with the maximum price manufacturer-wise.
- (iv) To count the total number of different manufacturers.

Ans. (i) Select P.ProductName, P.Price, C.ClientName from Product P, Client C Where
P.P_ID = C.P_ID Group By City;
(ii) Select Sum(Price) from Product Where Discount=NULL;
(iii) Select ProductName, Max(Price) from Product Group By Manufacturer;
(iv) Select Count (Distinct Manufacturer) from Product;

12. (i) Give one advantage of bus topology. Also, draw how four computers can be connected with each other in the star topology. 2

OR

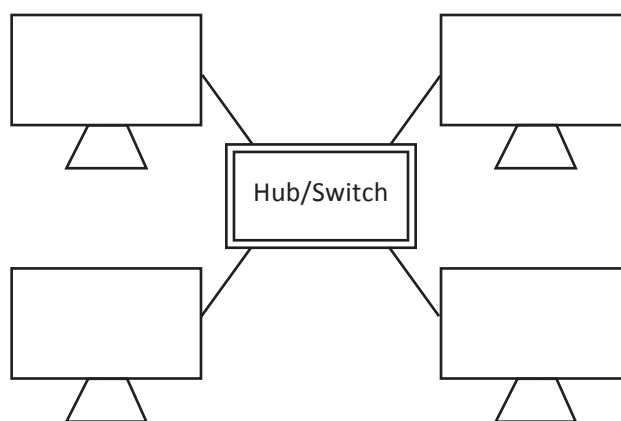
Define the following terms:

Wi-Fi, FTP

Ans. In a bus topology, the workstations can easily be extended or removed.

In star topology, four computers can be connected with each other through a central device—hub or switch.





Star topology

OR

Wi-fi: Wi-Fi is the wireless technology used to connect computers, tablets, smartphones and other devices to the internet wirelessly using microwaves.

FTP: FTP stands for File Transfer Protocol. It is a network protocol for transmitting files between computers over Transmission Control Protocol/Internet Protocol (TCP/IP) connections. It is also used to download new applications via web browsers.

(ii) Differentiate between Router and Gateway.

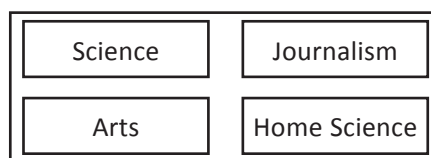
2

Router: Routers operate in the physical, data link and network layers of the OSI model. They decide the path a packet should take. A router is a networking device whose software and hardware are usually tailored to the tasks of routing and forwarding data packets across the network.

Gateway: A gateway operates on all the seven layers of the OSI model. A network gateway is a computer that has internet-working capability of joining together two networks that use different base protocols. The gateway converts one protocol to another and can, therefore, connect two dissimilar networks.

13. The University of Correspondence in Allahabad is setting up a network between its different wings. There are 4 wings named Science (S), Journalism (J), Arts (A) and Home Science (H).

4



Distance between various wings:

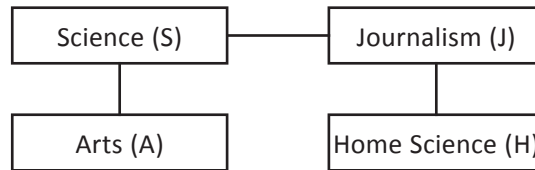
Wing A to Wing S	100 m
Wing A to Wing J	200 m
Wing A to Wing H	400 m
Wing S to Wing J	300 m
Wing S to Wing H	100 m
Wing J to Wing H	450 m

Number of Computers:

Wing A	150
Wing S	10
Wing J	5
Wing H	50

- (a) Suggest and draw a cable layout to efficiently connect various wings of the building within the university.
- (b) Name the wing where the Server is to be installed. Justify your answer.
- (c) Suggest the placement of the Repeater in the network.
- (d) The university is planning to establish the online classes. Name two applications that can be used to schedule and manage online classes.

Ans. (a) The most suitable cable layout is:



- (b) The Server should be installed in Wing A (Arts) as Wing A has the maximum number of computers and installing the server in this wing will help reduce the network traffic.
- (c) Repeater will be required in all the wings as the distance between each wing is equal to and greater than 100.
- (d) (i) Microsoft Teams
(ii) Zoom Meeting

