All Questions are compulsory:-

Revision Tour

1. Differentiate between an identifier and keywords.
2. Do you see any similarity between a typedef name and a reference name? If yes, what is it?
3. Give a difference between the type casting and automatic type conversion. Also give a suitable C++ code to illustrate both.
4. Why main () function is important in C++? Give reason.
5. How is an entry controlled loop different from exit controlled loop?
6. WAP to generate and display all the prime numbers up to N numbers.
7. What is the use of random () and randomize () functions? Explain with the help of a C++ program.
8. What is the difference between actual Parameter and Formal Parameter? Give a suitable C++ example to illustrate them.
9. What is the benefit of using function prototype for a function? Give a suitable example to illustrate it using C++ code.
10. WAP to illustrate the concept of passing an array of structures to a function.

Database And SQL

1. Give suitable example of table with sample data and illustrate the following:-

   a. Primary Key   b. Candidate Key   c. Foreign Key   d. Alternate Key

   e. Tuple   f. Cardinality   g. Relation   h. Record

2. What do you understand by selection and projection operation in relational algebra?

3. Explain the following commands and clause with proper example:-

   a) Create   b) Insert   c) Delete   d) Drop   e) View   f) Alter

   g) Update   h) having   i) Group by   j) join   k) Union   l) Distinct

   m) Select   n) Rename   o) All   p) Where   q) AND   r) OR

   s) Between   t) Not between   u) In Operator v) Like Operator

4- **(a)** Observe the following tables Employee and Manager carefully and write the name of the RDBMS operation which will be used to produce the output as shown in "Output". Also, find the degree and cardinality of the "Output". (2)

Employee

ID	Name
112	Riya
104	Aashish
151	Abhishek
201	Jyoti
114	Rachna

Manager

ID	Name
110	Muskan
114	Rachna
151	Abhishek
111	Yash
112	Riya

Output

ID	Name
114	Rachna
151	Abhishek
112	Riya

(b) Write SQL queries for (i) to (iv) and find outputs for queries (v) to (viii) on the basis of the tables MOBILE and VENDOR (6)

Table: VENDOR

CCode	Connection	Benefits
101	Airtel	3
102	Vodafone	2
103	Indicom	1
104	Idea	2
105	Reliance	3

Table: MOBILE

CID	Cname	Model	Activation	Validity (in days)	Amount (paid in ₹)	CCode
C01	Sita	Nokia	2004-06-04	365	3300	101
C02	Ritesh	Nokia	2005-02-12	60	575	102
C03	Reena	Samsung	2004-05-14	365	3030	102
C04	Meetali	Nokia	2004-09-24	180	890	103
C05	Ramanuj	Samsung	2004-10-16	180	900	104
C06	Anupam	LG	2005-01-18	60	600	102
C07	Sai Ram	Nokia	2004-12-10	180	890	103
C08	Deepa	LG	2005-03-08	30	300	105
C09	Karan	Sony	2005-01-30	90	800	104
C10	Jayant	Siemen	2005-02-02	60	560	101

(i) To display the names of all Samsung mobile users.

(ii) To display customer name and amount of all those mobiles whose amount is more than 800.

(iii) To display the number of users for each connection, i.e. the expected output should be

```
101    2
102    3
103    2
104    2
105    1
```

(iv) To display Cname, Model and Validity in decreasing order of Validity.

(v) SELECT COUNT(DISTINCT Model) FROM MOBILE:

(vi) SELECT MAX(Activation), MIN(Activation) FROM MOBILE:
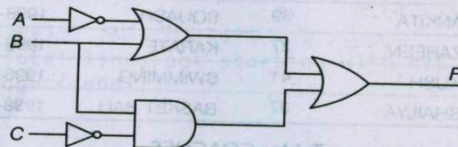
(vii) SELECT A.Connection, B.Cname, B.Amount FROM VENDOR A,MOBILE B
WHERE A.CCode=B.CCode AND Cname LIKE'r%'

(viii) SELECT Benefits, Cname, Activation FROM VENDOR, MOBILE
WHERE VENDOR.CCode=MOBILE.Ccode
AND Activation BETWEEN '2004-05-14' AND '2004-06-10':

5- **(a)** Prove algebraically $X.Y + \bar{X}.Z + Y.Z = X.Y + \bar{X}.Z$ (2)

(b) Obtain the Boolean expression for the logic circuit shown below: (2)

(c) Write the POS form of a Boolean function G, which is represented in a truth table as follows: (1)

U	V	W	G
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	1

(d) Reduce the following Boolean expression using K-map:
$$H(X, Y, Z, W) = \Sigma (0, 1, 2, 3, 5, 7, 8, 9, 10, 14, 15)$$
(3)

6- (a) Observe the following table CLASS and answer the following questions which are asked: (2

Table: CLASS

ID	Name	Class	Marks
101	Ruchi	XII-A	496
102	Deepika	XII-B	390
103	Jyoti	XII-A	450
104	Ekta	XII-C	270
105	Renu	XII-A	389

(i) Write the most appropriate primary key for the above table and justify your answer.

(ii) What is the degree and the cardinality of the above table?

(b) Consider the following CLUB and COACHES tables. Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii). (6)

Table: CLUB

CoachID	CoachName	Age	Sports	DateofApp	Pay	Sex
101	KUKREJA	35	KARATE	1996-03-27	1000	M
102	RAVINA	34	KARATE	1998-01-20	1200	F
103	KARAN	34	SQUASH	1998-02-19	2000	M
104	TARUN	33	BASKET BALL	1998-01-01	1500	M
105	ZUBIN	36	SWIMMING	1998-01-12	750	M
106	KETAKI	36	SWIMMING	1998-02-24	800	F
107	ANKITA	39	SQUASH	1998-02-20	2200	F
108	ZAREEN	37	KARATE	1998-02-22	1100	F
109	KUSH	41	SWIMMING	1998-01-13	900	M
111	SHAILYA	37	BASKET BALL	1998-02-19	1700	M

Table: COACHES

SportsPerson	Sex	CoachID
AJAY	M	101
SEEMA	F	102
VINOD	M	101
TANEJA	F	103

(i) To show all information about the swimming coaches in the CLUB.

(ii) To list names of all coaches with their date of appointment (DateofApp) in descending order.

(iii) To display a report showing CoachName, Pay, Age and bonus (15% of pay) for all the coaches.

(iv) To display the CoachName, SportsPerson from table CLUB and COACHES with their matching CoachID.

(v) SELECT COUNT(DISTINCT Sports) FROM CLUB;

(vi) SELECT MIN(Age) FROM CLUB WHERE Sex = 'F';

(vii) SELECT A.CoachID, A.CoachName, B.SportsPerson
FROM CLUB A, COACHES B
WHERE A.CoachID = B.CoachID AND SportsPerson ='VINOD';

(viii) SELECT CoachName, Age, Sports, SportsPerson, Pay FROM CLUB, COACHES
WHERE CLUB.CoachID = COACHES.CoachID AND Pay>1000;

7- (a) Verify the following algebraically: (2)

$$(\overline{A}+\overline{B}).(A+B)= \overline{A}.B+A.\overline{B}$$

(b) Write the Boolean expression for the result of the logic circuit as shown below: (2)
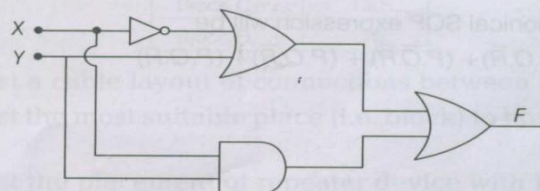
(c) Write the canonical SOP form of a Boolean function F, which is represen
in a truth table as follows:

P	Q	R	F
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

(d) Reduce the following Boolean expression using K-map
$$F(u, v, w, z) = \Pi\ (0, 1, 2, 4, 5, 6, 8, 10)$$

Networking

1   Define network with its sub type.

2.   Explain the evolution of network including ARPANET.

3.   Difference between Internet, Intranet & Interspace.

4.   What do you mean by switching Techniques? Explain circuit switching/Message switching and Packet switching?

5.   Explain Data communication Technologies in details.

6.   What do you mean by Topologies? Explain all types of Topologies with example.

7.   Explain Network devices.

1-	Modem	2-	RJ-45	3-	Ethernet card
4-	Hub	5-	Switch	6-	Repeater
7-	Bridge	8-	Router	9-	Gateway
10-	Wifi-card				

8.   What kind of protocols used in networking? Explain with example.

9.   Define Network security with its type.