





- f) Write a C++ function to sort an array having N integers in descending order using *insertion sort method*. **3**  
 g) What are the precondition(s) for Binary Search ? **1**

4. a) Observe the program segment given below carefully and answer the question that follows : **1**

```
class school
{ private :
  char name[25];
  int numstu;
  public:
    void inschool( );
    void outschool( );
    int retnumstu( )
    { return numstu; }
};

void modify(school A)
{ fstream INOUT;
  INOUT.open("school.dat",ios::binarylios::inlios::ate);
  school B;
  int reread=0, found=0;
  while(!found && INOUT.read((char*)&B,sizeof(B))
  { reread++;
    if(A.retnumstu( )= B.retnumstu( ))
    {
      _____//missing statement

    INOUT.write((char*)&A,sizeof(A));
    Found=1;
    }
    else
    INOUT.write((char*)&B,sizeof(B));
  }
  if(!found)
    cout<<"\nRecord for modification does not exist";
  INOUT.close( ); }
```

If the function **modify( )** is supposed to modify a record in file **school.dat** with the values of school A passed to its argument, write the appropriate statement for missing statement using **seekp( )** or **seekg( )**, whichever needed, in the above code that would write the modified record at its proper place.

b) Write a function in c++ to **add new objects** at the bottom of a binary file "**STU.DAT**", assuming that the binary file is containing the objects of the following class : **3**

```
class STUDENT
{ int rno;
  char Name[25];
  public:
    void Enter( ){ cin>>rno; gets(Name);}
    void Display( ){ cout<<rno<<Name<<endl;}
    int retrno( ) {return rno; } };
```

c) Write a function in c++ to **count & display** the number of lines **not starting with 'A'** present in a text file "**PARA.TXT**". **2**

5. a) What do you understand by the terms **Candidate key** and **Cardinality** of a relation? **2**

b) Write SQL commands for (i) to (vii) on the basis of the table LAB

**Table : LAB**

NO	ITEM NAME	COST	QTY	DATEOFPURCHASE	WARRANTY	OPERATIONAL
1.	COMPUTER	45000	9	21/5/96	2	7
2.	PRINTER	15000	3	21/5/97	4	2
3.	SCANNER	21000	1	29/8/98	3	1
4.	CAMERA	12000	2	13/6/96	1	2
5.	HUB	4000	1	31/10/99	2	1
6.	UPS	5000	5	21/5/96	1	4
7.	PLOTTER	13000	2	11/1/2000	2	2

- i) to select the item name purchased after 31/10/97. **1**  
 ii) to list item name, which are within the warranty period till present date **1**  
 iii) to list the name in ascending order of the date of purchase where quantity is more than 3. **1**  
 iv) to count the number of items whose cost is more than 10000. **1**  
 v) Give the output of the following SQL commands : **2**

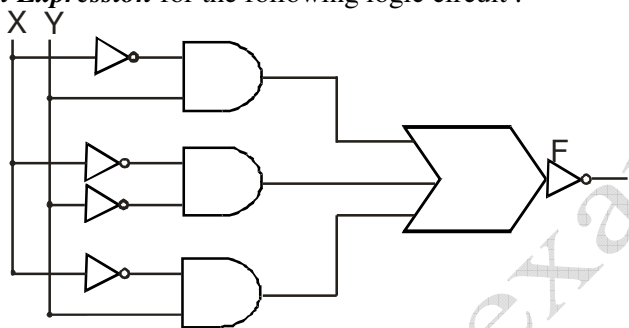
- a) SELECT MIN(DISTINCT QTY) FROM LAB;
- b) SELECT MIN(WARRANTY) FROM LAB WHERE QTY=2 ;
- c) SELECT SUM(COST) FROM LAB WHERE QTY>2 ;
- d) SELECT AVG(COST) FROM LAB WHERE DATEOFPURCHASE<{1/1/99} ;

- 6. a) State *De’Morgans law* and verify one of the laws using truth table . 2
- b) If  $F(w,x,y,z) = \sum (0,2,4,5,7,8,10,12,13,15)$  , obtain the simplified form using *K-Map*. 3
- c) Represent *AND using NOR* gate(s). 1
- d) Write the *POS* form of a Boolean function G, which is represented in a truth table as follows :

**1**

P	Q	R	G
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

- e) Write the *equivalent Boolean Expression* for the following logic circuit : 1



- 7. a) What are *routers*? 1
- b) Expand *SMSC, DHTML*. 1
- c) What are *backbone networks*? 1
- d) What do you mean by *twisted pair* cable? Write its *advantages & disadvantages*. (any two) 1
- e) Sunbeam Group of Institutions in Varanasi is setting up the network among its different branches. There are four branches named as Bhagwanpur (BGN), Lahartara (LHT), Varuna (V) and Annapurna (A). Distance between various branches are given below :

Branch BGN to V	7 Km
Branch V to LHT	4 Km
Branch V to A	3 Km
Branch BGN to LHT	4 Km
Branch BGN to A	3.5 km
Branch LHT to A	1 km

Number of computers :

Branch BGN	137
Branch V	65
Branch A	29
Branch LHT	98

- i) Suggest a *suitable topology* for networking the computer of all the branches. 1
- ii) Name the branch where the *server* should be installed. Justify your answer. 1
- iii) Suggest the placement of *hub or switches* in the network. 1
- iv) Mention any *economic way to provide internet accessibility* to all branches. 1



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