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Class : XII

SAMPLE PAPER

Max Marks : 70

Subject : Computer Science

Time Allotted : 3 hrs

General Instructions :

Programming Language : C++.

All questions are compulsory

1.(a) What are the differences between a data type struct and a data type class in C++ ? 2

(b) Write the names of header files, which are necessary to run the following program: 1

```
void main()
{ char STR[80];
  gets(STR);
  puts(strrev(STR)); }
```

(c) Rewrite the following code after removing all the syntax errors. Underline the corrections: 2

```
Typedef char[80] str;
Void main()
{ txt str;
  gets(txt);
  cout<<txt[0]<<'\t'<<txt[2];
  cout<<txt<<endl; }
```

(d) Observe the following programs & Find out the correct possible output/outputs from the options .
(Assuming that all required header files are included in the program) 2

```
i. void main()
{char serial[ ] = {'E', 'X', 'A', 'M'};
 int number [ ]= { 69,66,67,68};
 randomize();
 cout<<number[random(3)];
 for( int i=0;i<4;i++)
 cout<<serial[sizeof(int) + random(2)-1]; }
```

(i) 67XXAX (ii) 69AXXA (iii) 66AAXA (iv) 67AAAM (v) None

(e) Find the output of the following program segment (Assuming that all required header files are included in the program) 3

```
void main()
{ char Text[ ]="TALenT@orG";
 for(int i=0;Text[i]!='\0';i++)
 { if(!isalpha(Text[i]))
  Text[i]='*';
  else if(!isupper(Text[i]))
  Text[i]=Text[i]+1;
  else Text[i]=Text[i+1]; }
 cout<<Text ; }
```

(f) void main() 2

```
{ char * text="BHAVANS";
 int *p,num[]={1,5,7,9};
 p=num;
 cout<<*p<<text<<endl;
 text++; p++;
 cout<<*p<<text<<endl; }
```

2(a). What is function overloading? Explain it with example .

2

(b) Consider the following class counter and answer the questions following it:

2

```
class counter
{ protected : unsigned int count;
public :
  counter()//function 1      { count = 0; }
  ~counter();//function 2
  counter(counter&c);//function 3
  counter(int x);//function 4
  void inc_count() { count++; }
  int get_count() { return count; } };
```

1. What is function 1 called?

2. Which feature of OOP language is implemented in the above code by functions 1 2 3 and 4?

(c) Define a class MARKER with the following specifications :

4

Private members:

```
product_code character(6) ,
brand_name character(15)
```

Price float ,

```
Product_type character(L-long , S-short) ,
category character(20)
```

Public members:

*A constructor to assign initial values of product_code as ST200,
brand_name as "SONY" , product_type as 'L' and price as 10000 .

*A function det() which calculates category of the product based on the following calculations :

Price	category
<10000	Economy
>=10000 but <30000	Elegant
>=30000	Luxury

d) Answer the following questions (i) to (iv) based on the following code :

4

```
class DRUG
{ char catg[10]; char DOF[10], comp[20];
public:
  DRUG( ); void endrug( ); void showdrug( ); };
class TABLET : public DRUG
{ protected:
  char tname[30], volabel[20];
public:
  TABLET( );
  void entab( );
  void showtab( );
};
class PAINKILLER : protected TABLET
{ int dose, usedays;
  char seffect[20];
public :
  void entpain( );
  void showpain( );
};
```

i) How many bytes will be required by an object of TABLET?

ii) Write names of all the member functions of class PAINKILLER.

iii) Which type of inheritance is shown in above example ?

iv) Name the member function accessible by object of PAINKILLER .

3 (a) Consider the following structure result and write a function SORTMARKS() in C++ to sort an array of structure result in ascending order of marks scored by the students using Bubble Sort. 3

```
struct result
{ int roll;
  char name[20];
  int marks; };
```

(b) An array Array [20][15] is stored in the memory along the column with each element occupying 8 bytes. Find out the base address and the address of the element Array[2][3] if the element Array[4][5] is stored at the address 1000. 4

(c) Write the function definitions of the following class functions: 4

```
struct node
{ int book_no;
  char book_title[2];
  Node*next;
};
class stack
{ node*TOP;
  public:
  stack();
  ~stack();
  void PUSH( );
  void POP();
};
```

(d) Write a function which accepts a 2D array of integers and its size as its arguments and displays the elements which lie on the upper half triangle . [Assuming the 2D array to be a square matrix with dimensions i.e. 3x3, 4x4 etc]; 3

(e) Evaluate the following postfix expression showing the stack status : 2
False , True , NOT , OR , True , False , AND , OR

4. (a) Observe the following program carefully and fill in the blanks using seekg() and tellg() functions : 1

```
#include<fstream.h>
class school
{ private :
  char scode[10],sname[30];
  float nofstu;
  public:
  void INPUT( );      void OUTPUT( );      int COUNTREC( ); };
```

```
int school::COUNTREC( )
{ fstream fin("school.dat",ios::in|ios::binary);
  _____ //statement 1
  long B=_____ //statement 2
  int C=B/sizeof(school);
  fin.close( ); return C; }
```

(b) Assume that a text file named "ALPHA.TXT" already contains some text written into it . But while writing into the file , the word "are" has been misspelled "aer" everywhere in the file . Write a function named Rectify() in c++ that reads the file "ALPHA.TXT" and corrects the word "aer" . 2

(d) Given a binary file EMPLOYEE.DAT containing records of the following type : 3

```
class Emp
{ char ename[20], status ;
  int eid ;
  public: void read();
```

```

void show();
char getstatus()
{ return status ;
}
void setstatus(char s)
{ status = s;
}
int getid()
{ return id; } };

```

Write a function which changes the status of all Employee with previous status as 'A' to 'B' .

Q1.(i) Define the given terms in respect of Relational Database :

Cardinality of a Table and Degree of a Table.

2

ii) Write SQL commands for (a) to (f) and write the outputs for (g) to (j) on the basis of tables:

Table: Books

6

Book_Id	Book_Name	Author_Name	Publishers	Price	Type	Qty
F001	The tears	William Hopkins	First Publ	750	Fiction	10
F002	Thunderbolts	Anna Roberts	First Publ	700	Fiction	5
T001	My First C++	Brian & Brooke	EPB	250	Text	10
T002	C++ Brainworks	A.W.Rossaine	TDH	325	Text	5
C001	Fast Cook	Lata Kapoor	EPB	350	Cookery	8

Table: Issued

Book_Id	Quantity_Issued
F001	3
T001	1
C001	5

Write SQL queries for (a) to (f):

a) To show Book name, Author Name, and Price of books of EPB publishers.

b) To list the names of books of fiction type.

c) To display the names and price of the books in descending order of their price.

d) To increase the price of all books of First Publ by 50.

Give the output of the following queries based on the above tables:

g) SELECT COUNT (DISTINCT Publishers) FROM Books.

h) SELECT SUM (Price) FROM Books WHERE Quantity > 5

i) SELECT Book_Name, Author_Name FROM Books WHERE Price < 500

j) SELECT COUNT (*) FROM Books.

Q 2.(a) State and verify Distributive law algebraically.

2

(b) Find the complement of $AB(C'D+B'C)+BC'$.

2

(c) Write the equivalent canonical Sum of Product expression for the following Product of Sum expression $\pi(1,3,6,7)$

(d) Reduce the following Boolean Expression using K-Map:

3

$F(A,B,C,D) = \sum (0,2,3,4,6,7,8,10,12)$

- Q4.(a) Differentiate between Message Switching and Packet Switching. 1
- (b) Expand the following terminologies: 1
- (i) HTML (ii) GSM
- What is TCP\IP? 1
- What is the difference between Open source software and freeware? 1
- e) Differentiate between a hacker and a Cracker. 1
- (j) MS University is setting up its Academic buildings at Prayag Nagar and planning to set up a network. The university has 3 academic buildings and one Human Resource Center as shown in the diagram below :

[4]



Center to center distances between various building/center is as follows :

- Law Building to Business Building 40 m
- Law Building to Technology Building 80 m
- Law Building to HR Center 105 m
- Business Building to Technology Building 30 m
- Business Building to HR Center 35 m
- Technology Building to HR Center 15 m

Number of Computers in each of the Buildings / Center is follows :

- Law Building 15
- Technology Building 40
- HR Center 115
- Business Building 25

- (j1) Suggest the most suitable place (Building / Center) to install the server of this university with reason.
- (j2) Suggest an ideal layout for connecting these buildings/center for a wired connectivity.
- (j3) Which device you will suggest to be placed/ installed in each of these buildings/center to efficiently connect all the computers with in these buildings / center.
- (j4) The university is planning to connect its admission office in the closest big city, which type of network out of LAN, MAN or WAN will be formed? Justify your answer.