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HYDERABAD REGION

MODEL PAPER

Sub: Computer Science — Max Marks: 70

Class: XII — Time: 3 hr.

Note: (i) All questions are compulsory.

(ii) Programming Language: C++

1. (a) Differentiate between a global variable and a local variable. Also give suitable example in C++. 2

(b) Name the Header file(s), to which the following built-in functions belongs to: 1

(i) setw ( ) (ii)isdigit ( ) (iii) strcpy ( ) (iv) gotoxy ( )

(c) Rewrite the following program after removing syntactical error(s) if any. Underline each correction. 2

```
#include<iostream.h>
void main( )
{
        struct movie
        {       char movie_name[20];
                char movie_type;
                int tickets=100;
        } MOVIE;
        gets(movie_name);
        gets(movie_type);          }
```

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

```
char * NAME = ”AdmiNStrAtiOn”;
for( int x=0;x<strlen(NAME);x++)
if(islower(NAME[x])
        NAME[x] = toupper(NAME[x]);
else
if(isupper (NAME[x]))
        if(x%2==0)
        NAME[x] = NAME[x -1];
        else
        NAME[x]--;
Cout<<NAME <<endl;
```

(e) Find the output of the following program 3

```
#include<iostream.h>
void Modify(int &a,int b=10)
{       if(b%10==0)
                a+=5;
        for(int i=5;i<=a;i++)
                cout<<b++<<”:”;
        cout<<endl;                }
```

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```
void Disp(int x)
{       if(x%3==0)
                Modify(x);
        else
                Modify(x,3);                }
void main()
{       Disp(3);
        Disp(4);
        Modify(2,20);       }
```

(f) Differentiate typedef and #define with suitable example. 2

2. (a) Differentiate between a default and a parameterized constructor in context of class and object . Give suitable example in C++. 2

(b) Answer the questions (i) and (ii) after going through the following class 2

```
class Computer
{       char C_name[20];
        char Config[100];
        public:
                Computer(Computer &obj); // function1
                ~Computer();            //function 2
};
```

(i) Write the statement(s) which will invoke the function 1.

(ii) Name the specific feature of the class shown by function 2. Also write the time of its invoke.

(c) Define a class travel in C++ with the description given below : 4

Private members:

plancode	of type long
place	of type f characters array
number_of_travellers	of type integer
number_of_buses	of type integer

Public members:

A constructor to assign initial values of plancode as 1001, place as “Kolkata”, number_of_travellers as 5 and number_of_buses as 1

A function newplan( ) which allows user to enter plancode , place and number_of_travellers and also assign the number_of_buses as per the following conditions:

number_of_travellers	**number_of_buses**
less than 20	2
equal to and more than 20 and less than 40	3
equal to and more than 40	4

A function show( ) to display the contents of all the data members on the screen.

(d) Answer the questions (i) to (iv) based on the following code : 4

```
class Goods
{       int id;
        protected :
        char name[20];
        long qty;
        void Incr(int n);
```

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```
        public :
        Goods();
        ~Goods();
        void get();                 };
class Food_products : public Goods
{       char exp_dt[10];
        protected :
        int id;
        int qty;
        public :
        void getd();
        void showd();               };
class Cosmetics : private Goods
{       int qty;
        char exp_date[10];
        protected :
        int id;
        public :
        ~Cosmetics();
        Cosmetics();
        void show();                };
```

(i) How many bytes will be required by an object of class Food_products.

(ii) Name the member functions accessible through the object of class Food_products.

(iii) From the following, Identify the member function(s) that cannot be called directly from the object of class Cosmetics

```
show()
getd()
get()
```

(iv) If the class cosmetics inherits the properties of food_products class also, then name the type of inheritance.

3. (a) Write a function in C++ which accepts an integer array and its size as an arguments and exchanges first half side elements with second side elements of the array 4

Example:

If the given array as eight elements are

10, 15, 6, 16, 21, 20, 1, 0

The function should rearrange the array as

21, 20, 1, 0, 10, 15, 6, 16

(b) An array A[13][14] is stored in the memory along the column with each element occupying 4 bytes. Find out the Base address and address of the element A[3][7] if the element A[4][4] is stored at the address 1300. 3

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(c) Write a function in C++ to delete a node containing names of student, from a dynamically allocated stack of names implemented with the help of following structure : 3

```
struct student
{
        char name[20];
        student *next;      };
```

(d) Write a function in c++ which accepts a 2 D array of integers and its arguments as parameters which displays the sum of row elements. 3

[Assuming the 2 D array to be a square matrix with odd dimension i.e., 3 X 3 , 5 X 5, 7 X 7 etc.]

Example array is

```
5   3   8
10  0   4
7   4   6
```

The Output will be as follows

```
Row One is : 16
Row  Two is : 14
Row Three is : 17
```

(e) Evaluate the following postfix expression using a stack and show the contents of stack after execution of each operation: 2

25 8 3 - / 6 * 10 +

4. (a) What is the use of the following with syntaxes. 2

(i) read( ) (ii) get ( )

(b) Explain about the random access functions? 2

(c) Write a function in c++ to count number of uppercase letters present in a text file “article.txt”? 2

5. (a) What do you understand by DDL and DML. Write at least two DDL and DML commands. 2

(b) Consider the following tables Employee and salary. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii) 6

Table: Employee

Eid	Name	Deptid	Qualification	Sex
1	Deepali Gupta	101	MCA	F
2	Rajat Tyagi	101	BCA	M
3	Hari Mohan	102	B.A	M
4	Harry	102	M.A	M
5	Sumit Mittal	103	B.Tech	M
6	Jyoti	101	M.Tech	F

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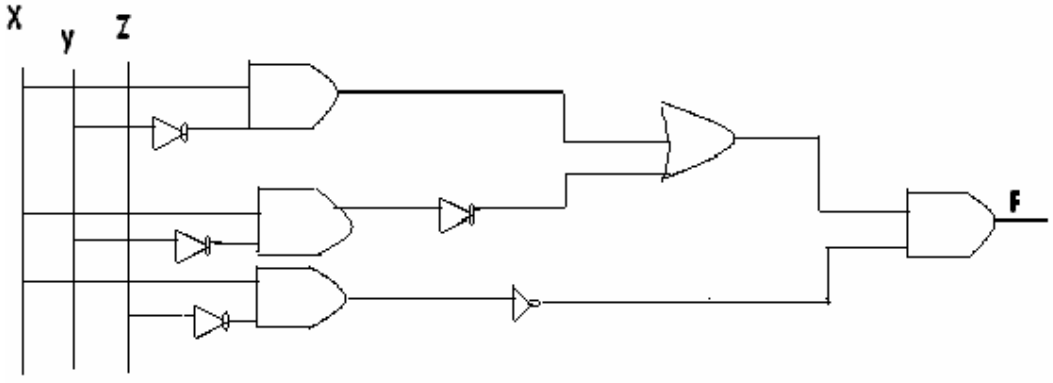
Table : Salary

Eid	Basic	DA	HRA	Bonus
1	6000	2000	2300	200
2	2000	300	300	30
3	1000	300	300	50
4	1500	390	490	30
5	8000	900	900	80
6	10000	300	490	150

(i) To display the name of employees department wise.
(ii) To list the names of those employees only whose basic is greater than 3000.
(iii) To print the net salary from salary table where as net salary is calculated as basic+da+hra+bonus
(iv) To display highest bonus among the all male employees.
(v) Select Name, basic, bonus from tables employee, salary Where employee.eid=salary.eid AND basic>5000;
(vi) select Avg(basic) from salary where bonus >40;
(vii) Select count(*) from employee where sex='F';
(viii) select name from employee where qualification like '%Tech';

6. (a) State and prove the absorption law algebraically. 2

(b) Write the equivalent Boolean expression for the following Logic Circuit. 2



(C) Convert the following expression into Canonical POS form

$$x + y\bar{z} + \bar{x}y$$

1

(D) Obtain the simplified form of a Boolean expression using K-Map. $F(A,B,C,D)=\sum (0, 1, 2, 5, 10, 12, 14, 15)$ 3

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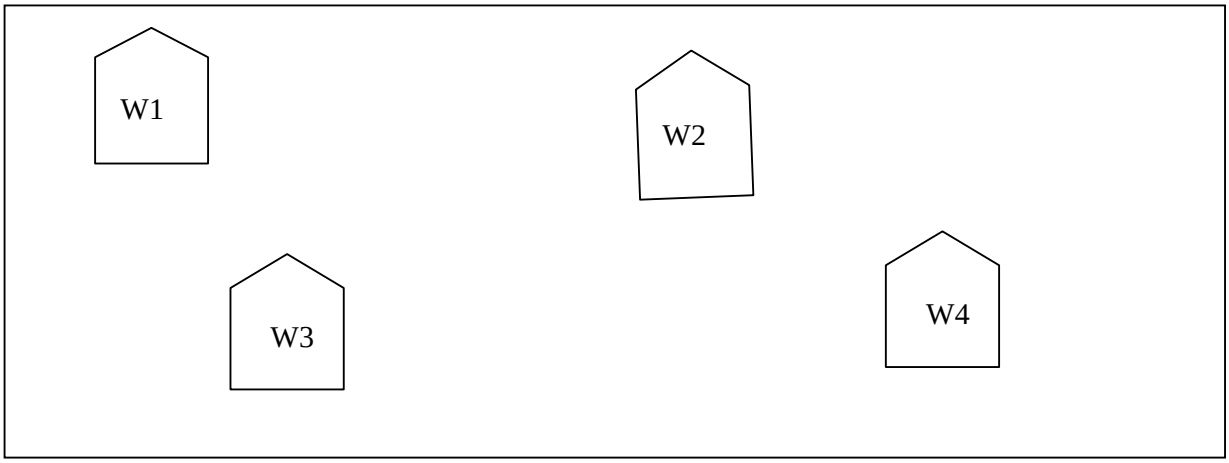
7. (a) What is repeater. 1

(b) Define the term Bandwidth. Give unit of Bandwidth. 1

(c) Expand the following terminology:

(i) Mbps (ii) GSM (iii) URL (iv) SMS 2

(d) A company in Reliance has 4 wings of buildings as shown in the diagram:



Center to center distances between various Buildings:

W3 to W1	50m
W1 to W2	60m
W2 to W4	25m
W4 to W3	170m
W3 to W2	125m
W1 to w4	90m

Number of computers in each of the wing:

W1	150
W2	15
W3	15
W4	25

Computers in each wing are networked but wings are not networked. The company has now decided to connect the wings also.

i) Suggest a most suitable cable layout of the connection between the wings. [1]

ii) Suggest the most suitable wing to house the server of this company with a suitable reason. [1]

iii) Suggest the placement of the Hub / Switch device with justification: [1]

iv) The company is planning to link its head office situated in India with the offices at Reliance. Suggest an economic way to connect it; the company is ready to compromise on the speed of connectivity. Justify your answer. [1]

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