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HALF YEARLY EXAMINATION 2016-17**

**CLASS XII
SUB: COMPUTER SCIENCE**

**TIME: 3 Hrs
MM : 70**

1. (a) What is the difference between call by reference and call by value with respect to memory allocation? Give a suitable example to illustrate using C++ code. 2

(b) Observe the following C++ code and write the name(s) of the header file(s), which will be essentially required to run it in a C++ compiler : 1

```
void main()
{ char CH,STR[20];
cin>>STR;
CH=toupper(STR[0]);
cout<<STR<<"starts with"<<CH<<endl;
}
```

(c) Rewrite the following C++ code after removing all the syntax error(s), if present in the code. Make sure that you underline each correction done by you in the code. 2

Important Note : – Assume that all the required header files are already included, which are essential to run this code. – The corrections made by you do not change the logic of the program.

```
typedef char[80] STR;
void main()
{ Txt STR;
  gets(Txt);
  cout<<Txt[0]<<' \t' <<Txt[2];
  cout<<Txt<<endl;
}
```

(d) Obtain the output from the following C++ program as expected to appear on the screen after its execution. 2

Important Note : - All the desired header files are already included in the code, which are required to run the code.

```
void main()
{ char *Text="AJANTA";
  int *P, Num[ ]={1,5,7,9};
  P=Num;
  cout<<*P<<Text<<endl;
  Text++;
  P++;
  cout<<*P<<Text<<endl;}
```

(e) Obtain the output of the following C++ program, which will appear on the screen after its execution.

3

Important Note : • All the desired header files are already included in the code, which are required to run the code.

```
class Game
{
    int Level, Score;
    char Type;
public:
    Game(char GType='P')
    {Level=1;Score=0;Type=GType;}
    void Play(int GS);
    void Change();
    void Show()
    {
        cout<<Type<<"@"<<Level<<endl;
        cout<<Score<<endl;
    }
};

void main()
{
    Game A('G'), B;
    B.Show();
    A.Play(11);
    A.Change();
    B.Play(25);
    A.Show();
    B.Show();
}

void Game::Change()
{
    Type=(Type=='P')?'G':'P';
}

void Game::Play(int GS)
{
    Score+=GS;
    if(Score>=30)
        Level=3;
```

```

else if (Score >= 20)
Level=2;
else
Level=1;
}

```

(f) Read the following C++ code carefully and find out, which out of the given options (i) to (iv) are the expected correct output(s) of it. Also, write the maximum and minimum value that can be assigned to the variable Taker used in the code :

2

```

void main()
{
    int GuessMe[4] = {100, 50, 200, 20};
    int Taker = random(2) + 2;
    for (int Chance = 0; Chance < Taker; Chance++)
        cout << GuessMe[Chance] << "#";
}

```

- (i) 100#
- (ii) 50#200#
- (iii) 100#50#200#
- (iv) 100#50

2. (a) What is function overloading ? Write an example using C++ to illustrate the concept of function overloading.

2

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

2

```

class Hospital
{
    int Pno, Dno;
public:
    Hospital(int PN); //Function 1
    Hospital(); //Function 2
    Hospital(Hospital &H); //Function 3
    void In(); //Function 4
    void Disp(); //Function 5
};

void main()
{
    Hospital H(20); //Statement 1
}

```

(i) Which of the functions out of Function 1, 2, 3, 4 or 5 will get executed when the Statement 1 is executed in the above code ?

(c) Define a class Tourist in C++ with the following specification:

4

Data Members

- CNo - to store Cab No
- CType - to store a character 'A', 'B', or 'C' as City Type
- PerKM - to store per Kilo Meter charges
- Distance - to store Distance travelled (in KM)

Member Functions

- A constructor function to initialize CType as 'A' and CNo as '0000'
- A function CityCharges() to assign PerKM as per the following table :

CType PerKM

A	20
B	18
C	15

- A function RegisterCab() to allow administrator to enter the values for CNo and CType. Also, this function should call CityCharges() to assign PerKM Charges.
- A function Display() to allow user to enter the value of Distance and display CNo, CType, PerKM, PerKM*Distance (as Amount) on screen.

(d) Consider the following C++ code and answer the questions from (i) to (iv):

4

```
class University
{ long Id;
char City[20];
protected:
char Country[20];
public:
University();
void Register( );
void Display( );
};

class Department: private University
{ long DCode[10];
char HOD[20];
protected:
double Budget;
public:
Department();
```

```

void Enter();
void Show();
};

class Student: public Department
{ long RollNo;
char Name[20];
public: Student();
void Enroll();
void View();
};

```

- (i) Which type of Inheritance is shown in the above example ?
- (ii) Write the names of those member functions, which are directly accessed from the objects of class Student.
- (iii) Write the names of those data members, which can be directly accessible from the member functions of class Student.
- (iv) Is it possible to directly call function Display() of class University from an object of class Department ? (Answer as Yes or No).

3. (a) Write code for a function void EvenOdd(int T[], int C) in C++, to add 1 in all the odd values and 2 in all the even values of the array T. 3

Example : If the original content of the array T is

```

T[0] T[1] T[2] T[3] T[4]
35  12  16  69  26

```

The modified content will be :

```

T[0] T[1] T[2] T[3] T[4]
36  14  18  70  28

```

(b) An array A[20][30] is stored along the row in the memory with each element requiring 4 bytes of storage. If the base address of array A is 32000, find out the location of A[15][10]. Also, find the total number of elements present in this array. 3

(c) Write a user-defined function AddEnd2(int A[][4],int N,int M) in C++ to find and display 2 the sum of all the values, which are ending with 2 (i.e., units place is 2).

For example if the content of array is :

```

22 16  12
19 5   2

```

The output should be

36

(d) Evaluate the following postfix expression. Show the status of stack after execution of each 2 operation separately :

T, F, NOT, AND, T, OR, F, AND

