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**Half Yearly – SEPT, 2015**

**SUB: COMPUTER SCIENCE**

**TIME: 3 hrs**

**CLASS: XII**

**TOTAL MARKS: 70**

**I**

- (a) What is the relevance of break in a switch statement? [2]
- (b) “While implementing encapsulation, abstraction is also implemented”. Comment [2]
- (c) Name the header file to which the following functions belong: [2]  
(i) itoa() (ii) getc()
- (d) Rewrite the following program after removing the syntactical errors (if any). Underline each correction: [2]  
class ABC  
{ int x=10;  
float y;  
ABC() {y=10; }  
~() {}  
}  
void main()  
{  
ABC a1(10);  
}
- (e) What does following function prototype means [2]  
a) void findsum(int &,int);  
b) int value(int x,int y, int r=5);
- (f) An array emp[20] contains the number of employees joined in different years . Write a short program to find the number of years in which no employee joined. [4]
- (g) Write the output of the following program : [3]

```
#include <iostream.h>
#include <string.h>
#include <ctype.h>
void swap(char &c1,char &c2)
{ char temp;
  temp=c1;
  c1=c2;
  c2=temp;
}
void update(char *str)
{
  int k,j,l1,l2;
  l1 = (strlen(str)+1)/2;
  l2=strlen(str);
  for(k=0,j=l1-1;k<j;k++,j--)
  {
    if(islower(str[k]))
      swap(str[k],str[j]);
  }
  for(k=l1,j=l2-1;k<j;k++,j--)
```

```

        {
            if(isupper(str[k]))
                swap(str[k],str[j]);
        }
    }
void main()
{
    char data[100]={"bEsTOfLUck"};
    cout<<"Original Data : "<<data<<endl;
    update(data);
    cout<<"Updated Data "<<data;
}

```

(h) In the following program, find the correct possible output.

[3]

```

#include<iostream.h>
void in(int x,int y, int &z)
{ x+=y; y—;
  z*=(x-y); }
void out(int z,int y, int &x)
{ x*=y; y++;
  z/=(x+y); }
void main()
{ int a=20, b=30, c=10; out(a,c,b);
  cout<<a<<"#"<<b<<"#"<<c<<"#"<<endl; in(b,c,a);
  cout<<a<<"@"<<b<<"@"<<c<<"@"<<endl; out(a,b,c);
  cout<<a<<"$"<<b<<"$"<<c<<"$"<<endl;
}

```

(i) Give the output of the following program code:

[2]

```

#include <iostream.h>
struct Pixel
{
    int c,r;
};
void display(Pixel p)
{
    cout<<"Col "<<p.c<<" Row "<<p.r<<endl;
}
void main()
{
    Pixel x = {40,50}, y, z;
    z= x;
    x.c = x.c + 10;
    y = z;
    y.c = y.c + 10;
    y.r = y.r + 20;
    z.c = z.c - 15;
    display(x);
    display(y);
    display(z);
}

```

## II

(a) How does the visibility mode control the access of members in the derived class? [2]  
Explain with example.

(b) Answer the questions (i) and (ii) after going through the following class: [2]  
class player

```
{
    int health;
    int age;
public:
    player() { health=6; age=18 } //Constructor1
    player(int s, int a) {health =s; age = a ; } //Constructor2
    player( player &p) { } //Constructor3
    ~player() { cout<<"Memory Deallocate"; } //Destructor
};
void main()
{
    player p1(7,24); //Statement1
    player p3 = p1; //Statement3
}
```

(i) When p3 object created, specify which constructor invoked and why?

(ii) Write complete definition for Constructor3?

(c) Define a class Employee in C++ with the following specification: [4]

Private Members:

- ename an array of char of size[50] ( represent employee name)
- deptname an array of char of size[20] ( represent department name)
- salary integer ( represent total salary of an employee)
- bonus float
- CalBonus() This function calculate the total bonus given to an employee according to following conditions

Deptname	Bonus
Accounts	4 % of salary
HR	5% of salary
IT	2% of salary
Sales	3% of salary
Marketing	4% of salary

Public Members:

- Constructor to initialise ename and deptname to NULL and salary and bonus to 0.
- A function read\_info to allow user to enter values for ename, deptname,salary & Call function CalBonus() to calculate the bonus of an employee.
- A Function disp\_info() to allow user to view the content of all the data members.

(d) Consider the following code and answer the questions: [4]

```
class typeA
{
    int x;
protected:
    int k1;
public:
    typeA(int m);
    void showtypeA(); };
class typeB : public typeA
```

```

{
    float p,q;
protected:
    int m1;
    void intitypeB();
public:
    typeB(float a, float b);
    void showtypeB(); };
class typeC : public typeA, private typeB
{
    int u,v;
public:
    typeC(int a, int b);
    void showtypeC(); };

```

- (i) How much byte does an object belonging to class typeC require?  
(ii) Name the data member(s), which are accessible from the object(s) of class typeC.  
(iii) Name the members, which can be accessed from the member functions of class typeC?  
(iv) Is data member **k1** of typeB accessible to objects of class typeB?

### III

- (a) Predict the output of the following code fragment: [2]

```

int a, b=3;
float x=10/b,y=20.0/b;
cin>>a;
b=a++ -1;
cout<< "a="<<a<<endl<<"b="<<++b<<endl;
cout<<"x="<<x<<endl<<"y="<<y;

```

When the value of a is entered as 6.

- (b) Write a program to find the product of two matrices entered by the user. [4]
- (c) What is function overloading? How is it done inside a C++ class? Give example. [4]
- (d) Write a menu based C++ program to do the following (Use user defined functions in each case): [6]
- Reversing the 1 D integer Array
  - Swapping the first half with the second half in an 1D integer array

### IV

- (a) To append data into a file, which stream file object you have to create? [1]
- (b) Differentiate between : [2]
- (i) read() and write() function  
(ii) tell() and seekg()
- (c) Observe the program segment given below carefully and fill in the blanks marked as **Statement 1** and **Statement 2** for performing the required task. [2]

```

#include <iostream.h>
#include <fstream.h>
void main(void)

```

```

{
    char filename[] = "C:\\testfileio3.txt";
    fstream inputfile, outputfile;
    int length;
    char * buffer;
    // -----create, open and write data to file-----
    outputfile.open(filename, ios::out);
    // ----write some text-----
    outputfile<<"This is just line of text."<<endl;
    // -----close the output file-----
    outputfile.close();
    // ----opening and reading data from file----
    inputfile.open(filename, ios::in);
    cout<<"The "<<filename<<" file was opened successfully!\n";
    cout<<"\nMove the pointer to the end\n"
    <<"Then back to the beginning with\n"
    <<"10 offset. The pointer now at...\n"<<endl;
    // flush the stream buffer explicitly...
    cout<<flush;
    // get length of file move the get pointer to the end of the stream
    inputfile.seekg(0, ios::end);
    // This statement returns the current stream position.
    length = _____ //Statement1
    cout<<"length variable = "<<length<<"\n";
    // dynamically allocate some memory storage for type char...
    buffer = new char [length];
    // move back the pointer to the beginning with offset of 10
    _____ //Statement2
    // read data as block from input file...
    inputfile.read(buffer, length);
    cout<<buffer;
    // free up the allocated memory storage...
    delete [] buffer;
    inputfile.close();
}

```

(d) Angel is confused with different types of random access used in file to move the pointer and which pointer to use where. Help her. [2]

(e) Given a binary file “TABLE”, containing the records of the following class type, [3]

```

class perdata
{
    int age;
    int weight;
    int height;
    char name[40];
public:
    void getdata() { cin>>age>>weight>>height>>name; }
    void showdata() { cout<<age<<" "<<weight<<" "<<height<<" "<<name<<endl;
}

int retage()
{
    return age;
}
};

```

Write a function in c++ that would read contents from the file *personal.dat* and creates a file named *eligible.dat* copying only those records from *personal.dat* having age 18 or more.

(f) **Example:** [4]

Do less Thinking and pay more attention to your heart. Do Less Acquiring and pay more Attention to what you already have. Do Less Complaining and pay more Attention to giving. Do Less criticizing and pay more Attention to Complementing. Do less talking and pay more attention to SILENCE.

(1) Assume a text file “coordinate.txt” is already created. Using this file create a C++ function to count the number of words having first character capital.

**Output will be :** Total words are 16

(2) Assume a text file “coordinate.txt” is already created. Using this file create a C++ function to count the number of sentences.

**Output will be :** Total sentences are 5

(g) Write a complete program to insert a record in a sorted binary file. [6]

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