



Date: 17/01/2008

Time: 9.30 am – 12.00 noon

Answer **Four** Questions Only.

Q1

i). What data type would you use to represent the following data items?

- (a) Avogadro's Number ( $6.022 \times 10^{23}$ ).
- (b) A/L students Z-Score in year 2007.
- (c) Weight of an elephant.
- (d) Number of Universities in Sri Lanka.
- (e) The average temperature of a city during a month.

ii). If  $a=2$ ,  $b=4$ ,  $c=6$ , and  $d=10$ , what will be the values of the following expressions?

- (a)  $c == a+b$ .
- (b)  $(a+b+c+d) >= 'a'$ .
- (c)  $a < b \ \&\& \ c < d$ .
- (d)  $!(a++ < d)$ .
- (e)  $a > c \ || \ b < d$ .

iii). Briefly explain what will happen during the execution of each of the following expressions.

- (a)  $a = (b <= (c+d)) ? i ; j$ ;
- (b)  $p = \text{sizeof} (--i)$ .
- (c)  $x = b+ = c$ .
- (d)  $y = b++$ .
- (e)  $m = \text{getchar} ()! = \text{eof}$ .

iv). Rewrite the following C++ program segments correcting all the errors.

```
(a) # program <iostream.h>
    {
        char a;
        begin
            a = A;
            cout << " The character is" << a;
            end;
    }
```

```

(b) # include <iostream.h>
    void main ( );
    {
        int m, s ;
        cout<<> " The summation of 1 to 10 numbers are"
        cout<<> "\n";
        s = m = 0;
        while (m<=10 ) do
            {
                s = s + m;
                m++;
            }
        cout<< s;
    }

```

Q2.

- (i). (a) What are the facilities provided in 'C' to manipulate strings ?.
- (b) Write the C++ codes for the following parts.
  - (a) Define two char pointer variables X and Y. Initialize Y to the address of X.
  - (b) Define two char array variables SUBJECT and CLASS. Initialize SUBJECT to CSU3279 and CLASS to Block8.
  - (c) Define two string variables S1 and S2 and initialize them to "Hello" and "Dear Friends" respectively.
  - (d) Assign the concatenated strings S1 and S2 into S1.
  - (e) Compare strings S1 and S2.
- (ii) Distinguish between '*If..Else*' statement and '*Switch*' statement using appropriate examples in the context of 'C++'
- (iii) Write a C++ program using '*while*' loop to find the following summation.

$$S = 1 + 3 + 3^2 + 3^3 + \dots + 3^{10} .$$

Q3.

- (i) State whether the following statements are **True** or **False** and give the reason briefly for your conclusion.
  - (a) A pointer variable can hold the address of another variable.
  - (b) 'strcmp' returns 0 if the strings are same.
  - (c) 'do...while' loop and 'while' loop work similarly during the execution time.
  - (d) 'break' statement and 'continue' statement are same in operation.
  - (e) Constants do not have data types.

(ii) What would be the output of following two program segments.

```
(a) #include <iostream.h>
void main( )
{
    int X,Y;
    X = 10;
    Y = X--;
    cout<< " X = " << X;
    cout<< " Y = " <<Y;
}
```

```
(b) #include <iostream.h>
void main( )
{
    int n;
    cout << " Enter a number which is less than 10";
    cin >> n;
    while (n <= 10 )
    {
        Cout << n << " ,";
        ++n;
    }
    cout<< "END";
}
```

(iii) During a game, players have to press a button among numbers 0 – 9. If he/she has chosen 1, 2 or 3 a message " go forward" should be displayed. Otherwise the message " try again" will be displayed. Write a C++ program for the above task.

Q4). State whether the following statements are **TRUE** or **FALSE** and give the reason for your conclusions briefly.

- The sign flag is '0' for positive numbers.
- In the context of C++, the prefixed increment operator (++x) and the post fixed increment operator (x++) gives the same meaning.
- In the context of C++ the if-else statement and the conditional operator can be used for the same task.
- When creating an array to store a string using C++ programming language, the array should consist with one space more than the number of characters of the string.

- e). *Extern* variables and *auto* variables perform the same role.
- f). Function overloading doesn't allow different functions to have the same name.
- g). A selector method is a read only method.
- h). Protected members are similar to public members.
- i). Constructor of a class should consist with the same name of the class.
- j). Private data in two classes can be accessed without using a friend function.

Q5). i). What would be the outputs of following two program segments.

a). # include < iostream.h >

```
void main ( )
{
    char *c;
    char * const strg = "abcd";
    cout<<" String is " << strg <<'\n';
        c = strg + 1;
        *c = 'X';
    cout<<" String is " << strg <<'\n';
}
```

b). # include < iostream.h >  
void swap ( int &a, int &b )

```
{
    int temp;
    temp = a;
    a = b;
    b = temp;
}
```

void main ( )

```
{
    int x = 3, y = 5;
    swap (x,y)
    cout<< " X = " << x << '\n';
    cout<< " Y = " << y ;
}
```

ii). What are the *storage classes*?. Describe each of them briefly.

- iii). Define a structure template to store a student's name and the date of birth as date, month and the year.
- iv). Write down a C++ program to input "01" and "Object Oriented Programme" into a structure template and display them using the reference notation.

Q6) i). Define a class to represent student information. Include the following members.

Data members

- i). Index number of the student.
- ii). Name of the student.
- iii). Marks obtained for the subject.

Member functions

- i). A default constructor.
- ii). A destructor.
- iii). A user defined constructor to initialize data members of the class.
- iv). A function to check whether the marks obtained by the student is greater than 35. If the student has scored greater than 35 there should be a message printed on the screen "You are pass". Otherwise the message has to be "Try again".

Write a main program to test your class.

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