

2920/203

OBJECT ORIENTED PROGRAMMING

July 2018

Time: 3 hours



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1. (a) State **three** merits of using a strongly typed language in applications development. (3 marks)
 - (b) Distinguish between *reference* variable and *global* variable as used in Object Oriented Programming. (2 marks)
 - (c) Describe Tokens as used in C++ programming language citing **three** categories. (5 marks)
 - (d) (i) Outline **two** differences between a *class* and an *Object* as used in Object Oriented Programming. (4 marks)
 - (ii) Write a C++ program that prompts the user to enter integer values from 5 to 9 then calculates the average. (6 marks)
2. (a) Table 1 shows C++ programming language escape sequences. Outline the purpose of each of them. (4 marks)

	Escape sequence
(i)	\r
(ii)	\t
(iii)	\v
(iv)	\a

Table 1

- (b) Explain each of the following, citing an example in each case:
 - (i) type conversation ;
 - (ii) type casting. (6 marks)
- (c) (i) Rearrange the following operators in order of precedence from the highest priority to the lowest.
Sizeof, - (cast), ! (unary), ++. (2 marks)
- (ii) Outline the difference between *call by value* and *call by reference* in a user defined function in C++. (4 marks)
- (d) Table 2 shows a C++ program code segment representing functions I, II, III and IV with functions calls 1, 2, 3 and 4. Identify the function that is called for each case. (4 marks)

```

...
long total (int x); //..... I
char choose( char a, char b); //.....II
char choose (char a); //.....III
float total (int x, float y); //.....IV
void main()
{
...
total(n); // .....1
choose('c'); // ..... 2
choose('c', 'd'); // .....3
total(n,n1); // .....4
}

```

Table 2

3. (a) Outline **three** rules followed when writing the floating point data types in scientific notation. (3 marks)
- (b) Explain the uses of each of the following with respect to C++ pointers: (4 marks)
- free ();
 - realloc ().
- (c) Table 3 shows the C++ control structure syntax. Use it to answer the questions that follow.

```

if (condition)
statement1;
statement2;
/*****/

```

Table 3.

- Identify the error in the syntax;
 - Rewrite the syntax correctly. (4 marks)
- (d) Write a C++ program code for a class candidate with following description:
- Private Members**
- A data member RNo (Registration Number) of type long
 - A data member Name of type string
 - A data member Score of type float
 - A data member Remark of type string
 - A member function AssignRem() to assign Remarks as per the Score obtained by a candidate. Score range and the respective Remarks are shown as follows:
- | Score | Remarks |
|--------------|--------------|
| ≥ 50 | Selected |
| less than 50 | Not selected |
- Public members**
- A function ENTER () to allow user to enter values for RNo, Name, Score & call function AssignRem() to assign the remarks.
 - A function DISPLAY () to allow user to view the content of all the data members.

4. (a) State **four** restrictions when overloading operators in C++. (9 marks)
- (b) A C++ program segment has the following variable declaration statements: (4 marks)

```

int a=5, b=20, c=10, d=5, e=7;
int result=0;

```

Determine the output of each of the following:

- result = (a * b) + c - d % e;
- result = a * (b + c) - d % e.

(4 marks)

- (c) Write a C++ program function to delete an element at a desired point in array A. (6 marks)
- (d) Each element in an array DATA [20][50] requires 4 bytes of storage. Base address of data is 2000, determine the location of DATA [10][10] when the array is stored as:
- (i) row major;
 - (ii) column major. (6 marks)

5. (e) Distinguish between *Multiple Inheritance* and *Hierarchical Inheritance* as used in

6. (a) (i) Outline **four** characteristics of a destructor. (4 marks)
 (ii) Explain the effect of *Object Slicing* during class inheritance. (2 marks)
- (b) Describe the functions of each of the following in C++:
 (i) assignment expression;
 (ii) copy constructor. (4 marks)
- (c) Distinguish between *static memory allocation* and *Dynamic memory allocation* with respect to C++ pointers. (4 marks)
- (d) Sheba has defined a C++ program segment with the following code:

```
class Exam
{
    int Marks;
    char Subject[20];
public:
    Exam () //Function 1
    {
        Marks = 0;
        strcpy (Subject, "Computer");
    }
    Exam(char, int) //Function 2
    {
        Marks = 0;
        strcpy (Subject, S);
    }
    Exam(int M) //Function 3
    {
        Marks = M;
        strcpy (Subject, "Computer");
    }
}
```

Write statements in C++ to carry out the following:

- (i) execute Function 2 and Function 3 of class Exam;
 (ii) implement a copy constructor for the class. (6 marks)
7. (a) Explain **two** ways of eliminating *Ambiguity* in a Multi-path class inheritance. (4 marks)
- (b) Outline **four** properties of an abstract class. (4 marks)
- (c) Distinguish between a *virtual table* and a *virtual pointer* as used in polymorphism. (4 marks)
- (d) Declare a class max, which has 3 integer data type members x, y and z, a function read to input the values of the data members and a function display to display, the greatest number between them. The program should prompt the user to enter the values from the keyboard. (8 marks)

8. (a) Table 4 shows I/O Console functions. State the purpose of each. (2 marks)

	I/O Function
(i)	putchar()
(ii)	gets()

Table 4

- (b) State the meaning of each of the following file mode parameters.
- (i) ios::beg; (3 marks)
 - (ii) ios::cur; (2 marks)
 - (iii) ios::end. (5 marks)
- (c) (i) State **two** types of exceptions in C++ programs. (2 marks)
- (ii) With the aid of a block diagram, explain the exception handling mechanism in C++ Programming language. (5 marks)
- (d) (i) State the meaning of each of the following C++ program statements:
- (I) `char a[]="string";`
 - (II) `char *p="string";` (2 marks)
- (ii) Write a function in C++ to count and display the number of lines starting with alphabet 'A' contained in a text file "STORY.TXT". (6 marks)

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