

2023

MATHEMATICS — GENERAL

Paper : SEC-A-2

(Object Oriented Programming in C++)

Full Marks : 80

*The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Each question below is followed by four possible answers, exactly one of which is correct. Choose the correct answer with proper justification/explanation, wherever possible, in support of your answer.

2×10

- (a) Maximum number of template arguments in a function template is

- (i) one (ii) two
(iii) three (iv) many.

- (b) Which one is escape sequence?

- (i) `\\ t` (ii) `\ t`
(iii) `/ t` (iv) `// t.`

- (c) Which one of the following is invalid real constant?

- (i) 0.0083 (ii) $2E + 10.2$
(iii) 435.76 (iv) +247.0

- (d) What are the values of x , y and z ?

```
int x, y = 10, z = 15;
```

```
x = ++ y + z ++;
```

- (i) $x = 25, y = 10, z = 15$ (ii) $x = 24, y = 11, z = 15$
(iii) $x = 26, y = 11, z = 16$ (iv) $x = 26, y = 11, z = 17$

- (e) Which one is not an operator?

- (i) + (ii) //
(iii) >= (iv) ||

- (f) A class defined within another class is

- (i) nested (ii) inheritance
(iii) containership (iv) encapsulation.

Please Turn Over

- (g) The operator to be used for overloading through friend function :
- (i) \rightarrow (ii) $=$
 (iii) $()$ (iv) $*$
- (h) Which direction is typically used to represent the flow of a process in a flow chart?
- (i) Left to right (ii) Top to bottom
 (iii) Right to left (iv) Bottom to top.
- (i) Loop defines
- (i) Jumping from one statement to another
 (ii) Breaking of the statements
 (iii) Repeating set of statements until condition is not satisfied
 (iv) Repeating set of statements until condition is satisfied.
- (j) By default, all members in a class are
- (i) public (ii) private
 (iii) protected (iv) none.

Unit - I

2. Answer *any four* questions :

- (a) Write the difference between High-Level Language and Low-Level Language. 5
- (b) Write a program to check if given number is divisible by 7 or not. 5
- (c) Write a short note on do-while loop. 5
- (d) Explain the working methodology of functions. 5
- (e) What are the advantages of C++ over C? Describe conversion operator. 3+2
- (f) Write a C++ program to find the greatest common divisor of two integers. 5
- (g) Discuss on arrays in C++ language. 5

Unit - II

3. Answer *any four* questions :

- (a) How can you define constant? Give example in C++ language. 5
- (b) Write a program to check whether a given number is positive or not. 5
- (c) State the difference between if else and switch case. Give examples. 5
- (d) Write a program to print the factorial of a given number. 5

(e) Distinguish between :

- (i) Object and Class
 - (ii) Polymorphism and Inheritance. 2+3
- (f) What is inline function? How does it differ from a standard / normal function? 2+3
- (g) What are Dynamic Binding and Virtual function? How do templates work in C++? 2+3

Unit - III

4. Answer *any two* questions :

- (a) (i) What are the advantages of using exception handling mechanism in a program?
 - (ii) Write a program to check if a triangle is equilateral, scalene or isosceles? 5+5
 - (b) (i) Write a C++ program to find the distance between two points.
 - (ii) Write a C++ program to develop a template to determine the maximum value as stored in any array. 5+5
 - (c) (i) Write a program in C++ to find the second smallest element in an array.
 - (ii) Write a program to find the transpose of a given matrix. 5+5
 - (d) Write a C++ program to swap two given numbers. Also, find the differences between template class and class template with an example. 5+5
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