

Roll No. ....

**E-764**

**M. A./M. Sc. (Third Semester)  
EXAMINATION, Dec.-Jan., 2020-21**

MATHEMATICS

(Optional—A)

Paper Third

(Fundamental of Computer Science)

*Time : Three Hours ]*

*[ Maximum Marks : 70*

**Note :** Attempt all Sections as directed.

**Section—A**

1 each

**(Objective/Multiple Choice Questions)**

**Note :** Attempt all questions.

Choose the correct answer :

1. Which symbol is used to declare destructor in C++ ?

(a) ::

(b) :

(c) ~

(d) -

**P. T. O.**

2. Which is not a type of constructor ?
  - (a) Default
  - (b) Copy
  - (c) Reference
  - (d) Parameterized
  
3. Which of the following is used for implementing the late binding ?
  - (a) Operator function
  - (b) Constraint function
  - (c) Virtual function
  - (d) Both (a) and (b)
  
4. Which of the following refers to using the existing code instead of rewriting it ?
  - (a) Inheritance
  - (b) Encapsulation
  - (c) Abstraction
  - (d) Both (a) and (b)
  
5. .... is/are used for generic programming.
  - (a) Inheritance
  - (b) Virtual function
  - (c) Templates
  - (d) None of the above

6. Operator overloading is also called ..... polymorphism.
  - (a) run time
  - (b) initial time
  - (c) compile time
  - (d) completion time
7. Which one of the following is the process of inserting an element in the stack ?
  - (a) push
  - (b) insert
  - (c) add
  - (d) None of the above
8. Which data structure is required to convert the infix to prefix notation ?
  - (a) link list
  - (b) stack
  - (c) binary tree
  - (d) queue
9. Which of the following principles does queue use ?
  - (a) LIFO principle
  - (b) FIFO principle
  - (c) Linear tree
  - (d) Ordered array
10. What is full binary tree ?
  - (a) Each node has exactly zero or two children.
  - (b) Each node has exactly two children.
  - (c) All the leaves are at the same level.
  - (d) Each node has exactly one or two children.

11. Which of the following is false about binary search tree ?
- (a) The left child is always lesser than its parent.
  - (b) The right child is always greater than its parent.
  - (c) The left and right sub-trees should be binary search trees.
  - (d) In order sequence give decreasing order of elements.
12. On which algorithm is heap sort based on ?
- (a) Fibonacci heap
  - (b) Priority queue
  - (c) Binary tree
  - (d) FIFO
13. How many arrays are required to perform deletion operation in a heap ?
- (a) 1
  - (b) 2
  - (c) 3
  - (d) 4
14. Which of the following sorting algorithms is fastest ?
- (a) Merge sort
  - (b) Quick sort
  - (c) Insertion sort
  - (d) Shell sort

15. What will be the number of passes to sort the elements using insertion sort ?

14, 12, 16, 6, 3, 10 :

- (a) 5
- (b) 6
- (c) 1
- (d) 7

**Section—B**

$1\frac{1}{2}$  each

**(Very Short Answer Type Questions)**

**Note :** Attempt all questions.

1. What is object oriented programming ?
2. What is destructor ?
3. Define polymorphism.
4. What do you mean by inheritance in OOP ?
5. What is a linear data structure ?
6. What is a Priority Queue ?
7. Write any *two* rules for B-tree.
8. Write the function supported by Binary Search tree.
9. What is a Hash Table ?
10. What is Shell Sort ?

**Section—C**

$2\frac{1}{2}$  each

**(Short Answer Type Questions)**

**Note :** Attempt any *six* questions.

1. Explain, which member function of class define outside of class.
2. Explain nested classes.

3. What is multiple inheritance ? Write its syntax.
4. Write difference between virtual and pure virtual function.
5. Explain postfix expression with example.
6. What is doubly linked list ?
7. Explain insertion sort.
8. What is sorting technique ? What is its use in data structure ?

**Section—D**

5 each

**(Long Answer Type Questions)**

**Note :** Attempt any *five* questions.

1. Explain the feature of object oriented programming.
2. Write a program to print factorial of number using class, object and member function.
3. Explain function overloading with example.
4. Explain multilevel inheritance with example.
5. Write complete note on binary tree.
6. Explain quick and heap sort.