B.Sc. Part–II (Semester-III) Examination

3S : COMPUTER SCIENCE/COMPUTER APPLICATIONS/INFORMATION TECHNOLOGY (NEW)

(Data Structure & C++)

Time : Three Hours] [Maximum Marks : 80

N.B. :— (1) **ALL** questions are compulsory.

(2) Question No. **1** carries **8** marks and all other questions carry **12** marks each.

(3) Assume suitable data wherever necessary.

1. (A) Fill in the blanks :

(i) _____ is also called LIFO.

(ii) _____ search algorithm is best for searching element in sorted data.

(iii) Assigning one or more function body to the same name is known as _____.

(iv) The mechanism of deriving a new class from existing class is known as _____. 2

(B) Choose the correct alternative :

(i) _____ is example of linear data structure.

(a) Stack (b) Tree

(c) Records (d) Tables

(ii) When we insert any element into queue, the value of _____ is increased by 1.

(a) FRONT (b) REAR

(c) TOP (d) INFO

(iii) _____ is not a fundamental data type in C++.

(a) float (b) string

(c) int (d) char

(iv) _____ is not an access specifier.

(a) Public (b) Private

(c) Protected (d) Friend 2

(C) Answer in **one** sentence :

(i) What is merging ?

(ii) What is Queue ?

(iii) What is derived class ?

(iv) What is data abstraction ? 4

2. (a) Explain the various operations performed on data structure. 6

(b) Write an algorithm to insert an element into a linear array. 6

OR

3. (a) What is array ? Explain the memory representation of array with example. 6

(b) What is stack ? Write an algorithm to delete an item from stack. 6

4. (a) What is queue ? Write an algorithm to insert an element into the queue. 6

(b) Explain the types of linked list. 6

OR

5. (a) Explain the concept of circular queue and priority queue with example. 6

(b) Write an algorithm to insert new node at the beginning in linked list. 6

6. (a) What is tree traversing ? Explain its types with suitable example. 6

(b) Explain the following sorting techniques with example :

(i) Selection sort (ii) Merge sort 6

OR

7. (a) Explain the algorithm to find the elements using sequential search method. 6

(b) What is tree ? Explain various types of trees with example. 6

8. (a) Explain specification of classes and objects with example. 6

(b) Explain scope resolution operator with suitable example. 6

OR

9. (a) Explain the structure of C++ program with example. 6

(b) Explain memory management operators : new and delete with example. 6

10. (a) Explain the concept of function overloading with example. 6

(b) Explain array of objects with suitable example. 6

OR

11. (a) Explain pointer to object with example. 6

(b) What is constructor ? Explain how constructor can be defined with syntax and example. 6

12. (a) What is operator overloading ? Explain the rules of operator overloading. 6

(b) Explain multilevel inheritance with syntax and example. 6

OR

13. (a) Explain virtual base class with example. 6

(b) Explain visibility mode with example. 6