B.Sc. Part–I (Semester–II) (New) (CBCS) Examination

COMP. SCI./COMP.APP./I.T.

DATA STRUCTURE AND OPPs

PAPER–ICS2

Time : 3 Hours]   [Maximum Marks : 80

Note :— (1)   All questions are compulsory.

     (2)   Question No. **1** carries 20 marks and all other questions carry 10 marks each.

     (3)   Assume suitable data wherever necessary.

1.   (A)   Fill in the blanks. (**1** mark each) :—   5

     (a)   _____ is an operation to remove the element from stack.

     (b)   In queue, the element is added then value of _____ is increased by 1.

     (c)   In _____ tree, left node is less than and right node is greater than that of root node.

     (d)   In _____ sort previous all elements are smaller than existing element.

     (e)   A mechanism that associates the code and the data it manipulates into a single unit is called _____.

   (B)   Select correct alternatives :—   10

     (a)   The virtual functions declared in the base class perform no task relative the class, such class is known as :

         (i)   Derived class   (ii)   Base class

         (iii)   Abstract base Class   (iv)   Virtual base class

     (b)   Which of the following is not a form of inheritance ?

         (i)   Multiple   (ii)   Hybrid

         (iii)   Multilevel   (iv)   Derived

     (c)   A special member function which is invoked automatically when an object is to be destroyed is called :

         (i)   Constructor   (ii)   Destructor

         (iii)   Copy Constructor   (iv)   None of these

     (d)   Which among the following is not an access specifier ?

         (i)   Public   (ii)   Private

         (iii)   Protected   (iv)   Friend

     (e)   The node located at the end of the tree is called as _____.

         (i)   End node   (ii)   Root node

         (iii)   Branch   (iv)   Leaf node

(f) The trees which have at most two child nodes are called _____.

    (i) Binary tree   (ii) Complete binary tree

    (iii) Binary search tree   (iv) None

(g) Stack is also called as _____.

    (i) FIFO   (ii) LIFO

    (iii) LOFI   (iv) FOFI

(h) _____ is a special member function in C++, which is used to initialize itself.

    (i) Destructor   (ii) Constructor

    (iii) Friend   (iv) None of these

(i) Derived class with several base classes is called _____ inheritance.

    (i) Single   (ii) Multiple

    (iii) Multilevel   (iv) Hybrid

(j) _____ provides the concept of reusability.

    (i) Class   (ii) Object

    (iii) Inheritance   (iv) Polymorphism

(C) Answer in one line :—   5

    (a) What is linked list ?

    (b) What is data structure ?

    (c) What is sibling in tree data structure ?

    (d) What is data hiding ?

    (e) What is inline function ?

2. (A) What is STACK ? Explain algorithm to insert and remove element from the stack.   7

   (B) What are different operations performed on the data structure ? Explain.   3

OR

3. (A) What is data structure ? Explain the types of data structure with suitable example.   7

   (B) Explain an algorithm to delete an element from the Array.   3

4. (A) What is Linked List ? Explain the types of Linked List with suitable examples.   7

   (B) Explain the Circular Queue with suitable example.   3

OR

5. (A) What is Tree Traversing ? Explain its types with suitable examples.   7

   (B) Explain Priority Queue with suitable example.   3

6. (A) Explain Insertion Sort method with algorithm and suitable example.   7

   (B) What is Indexed Sequential Search ? Explain.   3

OR

7. (A) Explain Binary search method with algorithm and example. 7

(B) Explain Quick Sort method with example. 3

8. (A) How to define member function outside the class ? Explain with suitable example. 7

(B) Explain Cin and Cout in C++ with suitable example. 3

OR

9. (A) Explain the program structure in C++. Give one suitable example. 7

(B) What are the Applications of OOP ? 3

10. (A) Explain the concept passing objects to and returning objects from function with suitable example.

7

(B) What do you mean by Array of Objects ? Explain with suitable example. 3

OR

11. (A) What is friend function ? Explain how to define and declare friend function with suitable example.

7

(B) What is destructor ? Explain it with suitable example. 3

12. (A) Write a program to overload '+' operator with member function definition. 7

(B) What is virtual base classes ? Explain with suitable example. 3

OR

13. (A) What is Inheritance ? Explain the Multilevel Inheritance with suitable example. 7

(B) What is visibility mode ? Explain all modes with suitable example. 3

B.Sc. Part—I (Semester—II) (CBCS) Examination

1CS2 : COMP.SCI./COMP.APP./I.T.

(Data Structure and Object Oriented Programming)

Time : Three Hours]   [Maximum Marks : 80

Note :— (1) All questions are compulsory.

   (2) Question No.1 contains **20** marks and all other questions carry **10** marks each.

   (3) Assume suitable data wherever necessary.

1.   (A) Fill in the blanks :—

   (a) Visit every part of the data structure exactly once is known as _____.

   (b) The _____ is made up by two parts that is Info and address (Next).

   (c) In _____ , two successive elements are compared and swapping is done if the first element is greater than second element.

   (d) Combining two similar data structures into one is known as _____.

   (e) The variables declared inside a class are known as _____.   5

   (B) Select correct alternative :—

   (a) Inheritance is a way to

      (i)   Make general classes into more complicated class

      (ii) Pass arguments to objects of classes.

      (iii) Add features to existing classes without rewriting them.

      (iv) Improve data hiding and encapsulation.

   (b) A special member function which is invoked automatically when an object is to be destroyed is called _____.

      (i)   Destructor   (ii) Constructor

      (iii) Function   (iv) None of these

   (c) Where does the execution of the program start ?

      (i)   User-defined function   (ii) Void function

      (iii) Main function   (iv) None of these

(d) Cout is _____.

    (i) Operator   (ii) Function

    (iii) Object   (iv) Macro

(e) The tree which have exactly two nodes is called _____.

    (i) Binary tree   (ii) Complete binary tree

    (iii) Binary search tree   (iv) None

(f) At the time of insertion in STACK, Top is _____.

    (i) Top = 0   (ii) Top + 1

    (iii) Top – 1   (iv) Top = 1

(g) Linked list is a _____ Data structure.

    (i) Non primitive   (ii) Non Linear

    (iii) Linear   (iv) None of these

(h) A _____ statement is used to return values to the invoking function.

    (i) Return   (ii) Void

    (iii) Getch   (iv) None of these

(i) Overloading unary minus operator using friend function takes _____ argument.

    (i) One   (ii) Two

    (iii) Three   (iv) Four

(j) Adding new element into the stack is called_____.

    (i) Deletion   (ii) Insertion

    (iii) Searching   (iv) None of these   10

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

    (i) What do you mean by circular queue ?

    (ii) Define data structure.

    (iii) What do you mean by sequential search ?

    (iv) What do you mean by do-nothing function ?

    (v) What is constructor ?   5

2. (A) What is stack ? Explain the concept of stack.   3

  (B) What is array ? Explain the concept of array and its memory representation.   7

OR

3. (A) Define and explain Primitive and Non-Primitive data structure with example. 7

   (B) Explain the operations performed on Data Structure. 3

4. (A) What is Queue ? Explain the types of queue with suitable example. 7

   (B) Define the following :-

   (i)   Branch

   (ii) Level of tree

   (iii) Degree of node. 3

OR

5. (A) Explain the algorithm to delete any node from the tree. 3

   (B) What is linked list ? Explain the algorithm to insert new node in the linked list (in the beginning). 7

6. (A) Explain quick sort method with algorithm. 7

   (B) Explain linear search method. 3

OR

7. (A) Explain binary search method with algorithm. 7

   (B) Explain bubble sort method. 3

8. (A) What is manipulator ? Explain any two manipulator with suitable example. 3

   (B) What is class ? Explain class specification and creating objection with suitable example. 7

OR

9. (A) What are the Applications of OOP ? 3

   (B) Explain the program structure in C++ with example. 7

10. (A) What is destructor ? Explain with syntax and example. 3

    (B) Write a program to overload function subtract ( ). 7

OR

11. (A) What is inline function ? Explain with suitable example. 3

    (B) What is constructor ? Explain parameterized constructor with example. 7

12. (A) Write a program to overload ++ operator with friend function in C++. 7

    (B) What is inheritance ? Explain single inheritance with suitable example. 3

OR

13. (A) Write a program in C++ to overload binary operator with member function. 7

    (B) What is virtual base classes ? Explain with example. 3