

CVM UNIVERSITY

M.Sc. (Information Technology) Semester-I Examination-2021

Wednesday, 24th February – 2021

2:00 PM to 4:00 PM

101410102: Advanced Programming Concepts & Data Structures

Total Marks: 60

- Note: (1) Attempt all questions.
(2) Figures to the right indicate marks.

Q. 1 (a) Answer the following multiple choice questions. (08)

- (1) A constructor is called whenever
(A) an object is declared (C) an object is used
(B) a class is declared (D) a class is used
- (2) Identify the operator that is NOT used with pointers.
(A) -> (C) *
(B) >> (D) &
- (3) Which member can always be accessed by all inherited classes?
(A) Private member function (C) Protected member function
(B) Public member function (D) All can be accessed
- (4) Which of the following is used for generic programming?
(A) Virtual Functions (C) Templates
(B) Modules (D) Abstract Classes
- (5) Which of the following data structures is related to LIFO?
(A) Stack (C) Tree
(B) Queue (D) Linked List
- (6) Linked List is _____ data structure.
(A) Linear (C) Non Linear
(B) Both A & C (D) None of these
- (7) Which of the following sorting algorithm is of divide and conquer type?
(A) Bubble Sort (C) Merge Sort
(B) Selection Sort (D) Heap Sort
- (8) Which of the following algorithm does not divide the list?
(A) Linear Search (C) Merge Sort
(B) Binary Search (D) Quick Sort

(b) Answer the following (Fill in the blanks and True or False) (08)

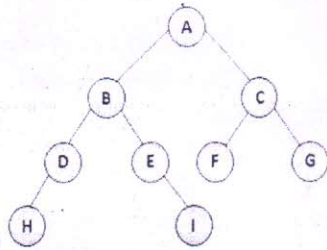
- (1) Destructor is declare in C++ with _____ Symbol.
- (2) C++ was originally developed by _____ .
- (3) A pure virtual function is equal to _____ .
- (4) Each C++ program may have many main functions.
(A) True (B) False
- (5) Children of the same parent are called _____ .
- (6) FIFO stands for _____ .
- (7) _____ traversal algorithm process root first.
- (8) Suppose an array X is declared as int X[5]; The base address of the array is 100 and integers take up 4 bytes. Then, the address of X[2] is 110.
(A) True (B) False

Q.2

Attempt **any six** of the following.

(12)

- (1) Explain Structure of C++ Program.
- (2) Explain Scope Resolution Operator with example.
- (3) Write a note on parameter passing using pass by value and pass by reference.
- (4) Explain method overloading using with proper example.
- (5) Consider the following tree and answer the questions that follow:
 - a. What is the depth of the tree?
 - b. Which nodes are children of node B?
 - c. Which node is the parent of node F?
 - d. Which nodes are the siblings of node H?



- (6) What is Linked List?
- (7) Differentiate between Sequential Search and Binary Search.
- (8) Write a short note on Height Balanced Tree.

Q. 3 Explain characteristics of OOP's (Object Oriented Programming). Explain the basic terminology related to OOP's. List advantages and disadvantages of OOP's. (08)

OR

Q.3 What is an Inheritance and types of Inheritance and explain any one with suitable example. (08)

Q. 4 Explain Friend Function with its syntax & example. Write down the characteristics of Friend Function. (08)

OR

Q. 4 What is Operator Overloading? Explain Unary operator overloading with suitable example. (08)

Q. 5 What is Stack? Write an algorithm for PUSH and POP operation of stack. (08)

OR

Q. 5 What is Queue? Write an algorithm to insert and delete an element of Queue. (08)

Q. 6 What is sorting? Write down types of sorting. Explain any one sorting using with example. (08)

OR

Q. 6 Write a short note on: (08)

- (i) Default arguments
- (ii) Inline function
- (iii) Division Method- Hashing Function
- (iv) Linear and Non-Linear Data structure
