LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.C.A. DEGREE EXAMINATION – **COMPUTER APPLICATIONS**

FIRSTSEMESTER – APRIL 2018

CA 1805- PROGRAMMING & DATA STRUCTURES THRO C++

Date: 02-05-2018 Dept. No. Max. : 100 Marks
Time: 01:00-04:00

PART – A

Answer all Questions: **10 x 2 = 20**

1. What are the features of Object Oriented Programming?
2. Define pointer. State its use.
3. What are the characteristics of constructor?
4. What are manipulators? Mention some important manipulator functions.
5. Define stack. Mention any two of its applications.
6. What is List? Mention the operations that can be performed in a list.
7. Define binary tree. List its traversal methods.
8. What are threaded binary trees?
9. Define Graph.
10. What is minimum spanning tree?

PART – B

Answer all Questions: **5 x 8 = 40**

11.a. Illustrate the control statements with example.

(OR)

b. Write short note on the operators used in C++.

12.a. Define function. Explain any two categories of function with example.

(OR)

b. What is inheritance? Explain the types of inheritance.

13.a. What is linked list? Illustrate the following in singly linked list.

i. insertion at the beginning.

ii. insertion at the middle.

iii. insertion at the end.

(OR)

b. Perform the following sorting for the given data.

111, 234, 879, 765, 546, 478, 695, 314, 910, 419, 384, 711.

i. Selection sort

ii. Bubble sort

14.a. Reconstruct the binary tree using the following notations.

INFIX notation : D G B H E A F I C

PREFIX notation: A B D G E H C F I

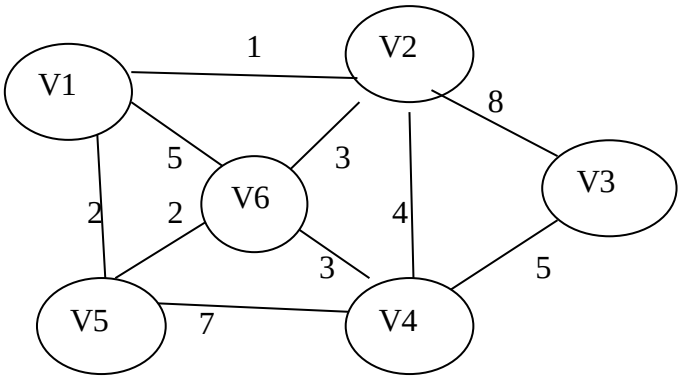
(OR)

b. Explain Hash functions with example.

15.a. Construct minimum spanning tree for the graph using the following algorithms

i. Kruskal's algorithm

ii. Prim's algorithm.



(OR)

b. Illustrate the types of graphs with example.

PART-C

Answer any TWO Questions: **2 X 20 = 40**

16.a. Explain the following :

i.Basic concepts of OOP's (7marks).

ii. Applications of OOP's (3 marks).

b. Illustrate the exception handling mechanism with example.

17.a. Illustrate the following:

i. stack operations.

ii.types of queue.

b. Perform the following for the given data

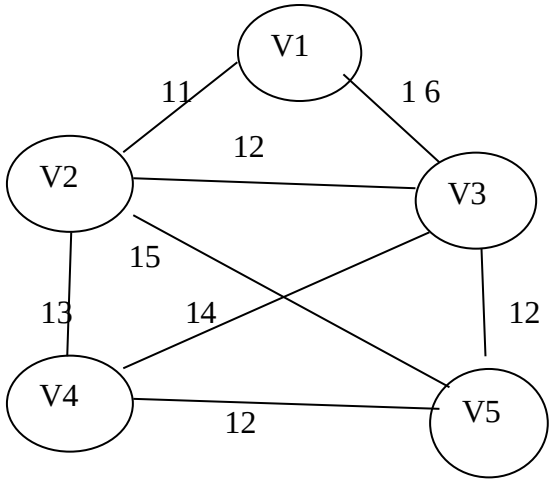
11, 13 , 29, 22, 27, 30, 20 , 23, 40, 45, 7, 37, 6, 9, 15.

i. construction of Max heap.

ii. Heap sort.

18.a. Find the shortest path using Dijkstra's algorithm for the given graph.

(Source vertex V1)



b. What are AVL trees? Illustrate the rotations for the following cases.

i. Left to Left rotation.

ii. Right to Right rotation.