



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.C.A. DEGREE EXAMINATION – COMPUTER APPLICATIONS

FIRST SEMESTER – NOVEMBER 2017

CA 1805 - PROGRAMMING & DATA STRUCTURES THRO C++

Date: 04-11-2017
Time: 01:00-04:00

Dept. No.

Max. : 100 Marks

Answer all Questions:

10 x 2 = 20

1. Mention the applications of OOPs.
2. List the operators that cannot be overloaded.
3. Define polymorphism. List its types
4. What are manipulators? Give example.
5. Define Queue. Mention the types of queue
6. What is a Linked list? List its operations.
7. Define Binary search tree. Give an example.
8. What are the basic rules of Red Black trees?
9. Define Graph. What are the ways of representing a graph?
10. What is minimum spanning tree?

PART – B

Answer all Questions:

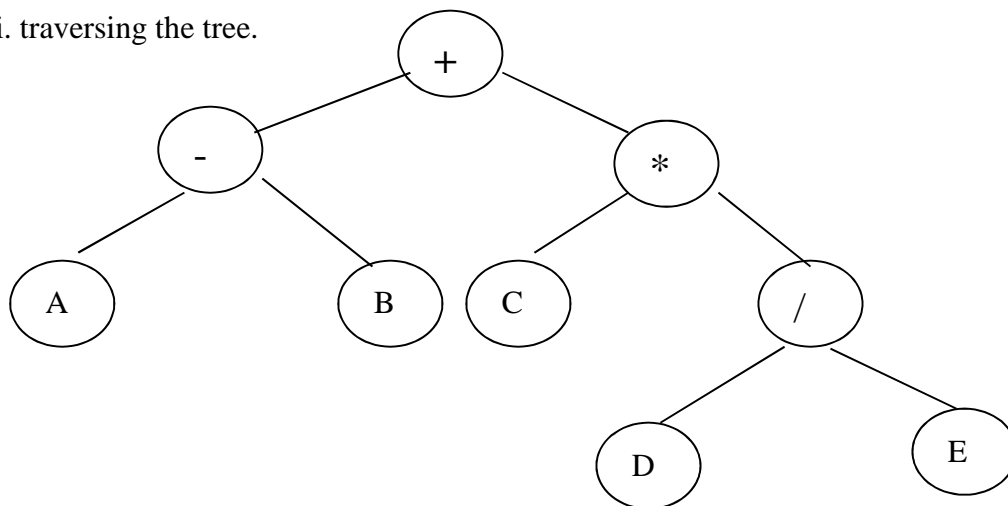
5 x 8 = 40

- 11.a. Write short notes on the basic concepts of OOP's.
(OR)
 - b. Explain the operators used in C++.
- 12.a. Define function. What are the categories of function? Explain any two.
(OR)
 - b. What is an exception? Explain the exception handling mechanism.
- 13.a. Illustrate the following in single linked list.
 - i. insertion at the beginning.
 - ii. insertion at the middle.
 - iii. insertion at the end.
 - iv. deletion at any position.(OR)
 - b. Perform the following sorting for the given data:
116, 960, 843, 765, 592, 447, 693, 209, 903, 350, 219, 650.
 - i. Quick sort
 - ii. Radix sort.

14.a. Explain the following for the given tree

i. representing the tree.

ii. traversing the tree.



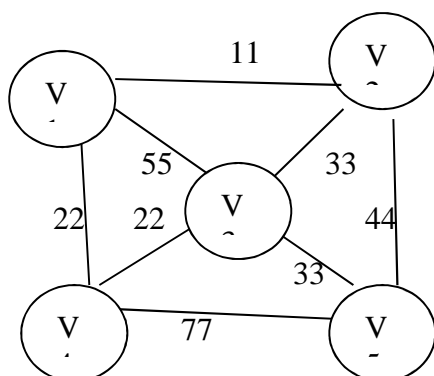
(OR)

b. Explain Hash functions with examples.

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

i. Kruskal's algorithm

ii. Prim's algorithm.



(OR)

b. Write short notes on the types of Graph.

PART-C

Answer any TWO Questions:

2 X 20 = 40

16.a. Explain the following with example:

i. any two branching statements

ii. any two looping statements.

16.b. Illustrate the types of constructors with examples.

17.a. Illustrate the following using stack

iii. operations with boundary conditions.

ii. $A + (B * C - (D / E - F) * G) * H$ infix to postfix conversion.

b. Perform the following for the given data:

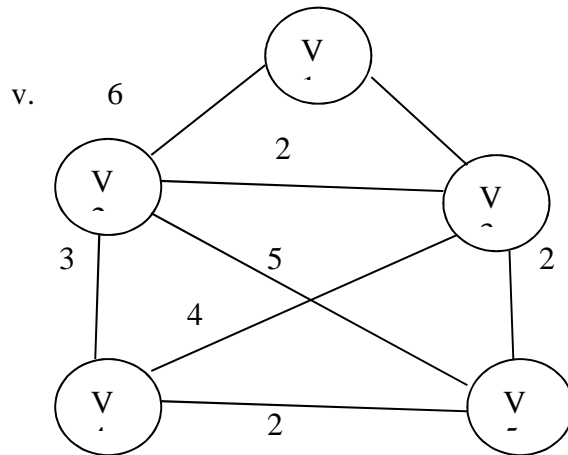
11, 13, 29, 22, 27, 30, 20, 23, 40, 45, 7, 37, 6, 9, 15.

iv. Construction of Max heap.

ii. Heap sort.

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

(Source vertex V5)



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

i. Left to Left rotation.

ii. Left to Right rotation.

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