

Total No. of Questions : 5]

SEAT No. :

P-1294

[Total No. of Pages : 2

[6055]-201

S.Y. B.Sc. (Semester - IV)

COMPUTER SCIENCE

CS 241 : Data Structures and Algorithms - II

(2019 Pattern) (CBCS) (24121)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn whenever necessary.
- 4) Your answers will be value as whole.

Q1) Attempt any eight of the following :

[8 × 1 = 8]

- a) Define min heap.
- b) What is level order traversal?
- c) What is descendant in tree?
- d) In B+ tree data can only be stored in leaf node. State true or false.
- e) List AVL tree Rotations.
- f) List any two minimum spanning tree algorithms.
- g) "DFS uses queue implementation". State true or false.
- h) What is weighted graph?
- i) What is load factor?
- j) What is hashing?

Q2) Attempt any four of the following :

[4 × 2 = 8]

- a) Write a note on minimum spanning tree.
- b) Write a note on splay tree.
- c) Give any two differences between DFs & BF.
- d) Explain any two properties of good hash function.
- e) Write a note on B tree.

P.T.O.

**Q3)** Attempt any two of the following :

[2 × 4 = 8]

- a) Write a 'C' function to calculate
  - i) leaf nodes
  - ii) non leaf nodes
- b) Write a program that accepts adjacency matrix and print indegree and outdegree of each vertex.
- c) Write a program to insert new element in hash table.

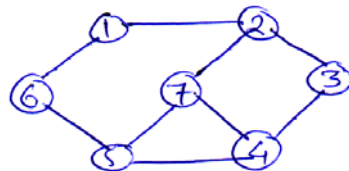
**Q4)** Attempt any two of the following :

[2 × 4 = 8]

- a) Construct Red Black Tree for 2, 10, 7, 20, 30, 25, 50.
- b) Consider following adjacency matrix

$$\begin{bmatrix} 1 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 \\ 1 & 0 & 1 & 1 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

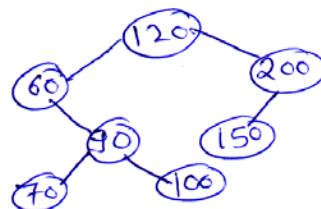
- i) Draw the graph
- ii) Give adjacency list
- c) Construct minimum spanning tree using Kruskal's algorithm.



**Q5)** Attempt any one of the following :

[1 × 3 = 3]

- a) Define the following terms :
  - i) Terminal node
  - ii) depth of node
  - iii) root node
- b) Give inorder, preorder and postorder traversal for :



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