

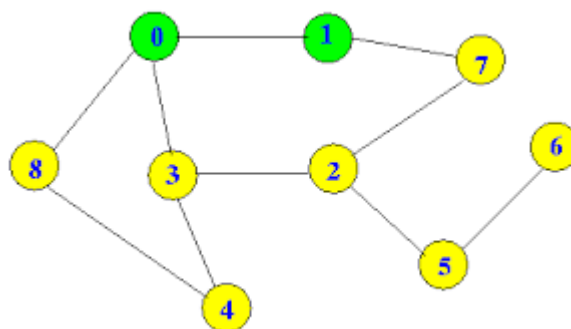


EAST WEST UNIVERSITY
Department of Computer Science and Engineering
B.Sc. in Computer Science and Engineering Program
Final Examination, Spring 2019 Semester

Course: CSE 207- Data Structures, Section-4
Instructor: Tanni Mitra, Senior Lecturer CSE Department
Full Marks: 30 (20 will be counted for final grading)
Time: 1 Hour and 20 Minutes
Submission Time: 10 Minutes

Note: There are SIX questions, answer ALL of them. Course Outcome (CO), Cognitive Level and Mark of each question are mentioned at the right margin.

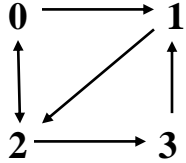
1. Suppose, you are running a hospital and patients are coming in. There is only one doctor on staff to serve the patients. Patients visiting the hospital can broadly be classified as requiring one or more of the following categories of care- [CO3,C3, Mark: 6]
 Category 1: major trauma care
 Category 2: critical care cases
 Category 3: non-critical and minor care
 Category 4: non-emergency or primary care
 Category 5: Routine checkups.
 Consider at a particular instance of time, 10 patients arrive in order with the priorities 5, 3, 4, 2, 1, 3, 1, 2, 4, and 5. Now build a Binary Heap using the priority number.
 - b. Now delete the top four priority patients from the heap and perform necessary operations to **rebuild** the heap after deletion. [CO3,C3, Mark: 4]
2. **Show** depth-first traversal of the following graph, where 0 is the starting node. Visit adjacent nodes in an anticlockwise ordering from a particular node (12 o'clock position). [CO3,C3, Mark: 5]



3. a. Insert the following sequence of elements into an AVL tree, starting with an empty tree: 10, 20, 15, 25, 30, 16, 18, and 19. Show the tree generated for each insertion. Also show the rotation that needs to be performed to balance the AVL tree. [CO3,C3, Mark: 5]
 b. Delete 30 in the AVL tree that you got from question 3(a).

4. Given an array of integers [12, 3, 40, 1, 21, 4, 1] now sort the elements in ascending order using Binary Heap. Show each step graphically while sorting the elements. [CO3,C3, Mark: 5]
5. Write a program to find the vertex with maximum degree whose graph is stored in an adjacency list. [CO3,C3, Mark: 5]

Example:

Input	Output
Number of Vertices, n = 4 	Vertex 2 has maximum degree