K. J. Somaiya College of Engineering, Mumbai-77

End Semester Exam

December 2020

Max. Marks: 30

Duration: 1 Hr. 15 Min. (For attempting questions) + 15 min. (uploading)

Class: SY B.Tech Semester: III

Name of the Course: Data Structures Branch: IT/COMP

Course Code: 2UIC302/2UCC302

Instructions:

(1) **All questions are compulsory**

(2) **Draw neat diagrams (use PEN only)**

(3) **Assume suitable data if necessary**

Question No.		Max. Marks
Q.1	Attempt any **ONE** 1) Differentiate between linear data structures and non-linear data structures. (5 points) 2) What is ADT? Explain with an example.	05M
Q.2	Write pseudo codes along with the pictorial representation for following functions 1) DeleteBefore on DLL (3M) 2) Insert on static circular queue (2M) 3) InsertBefore SLL (3M) 4) DeleteLast on circular SLL (2M)	10M
Q.3	Attempt any **TWO** 1) Write the pseudocode for function deleting a node from a binary search tree. 2) Using an appropriate data structure, show step-by-step, depth first search traversal algorithm applied on following graph (represented in adjacency matrix form) and write the final sequence of traversal. Consider vertex 1 as starting vertex. 3) Perform following operation on an initially empty B tree of order 4. Insert – 78, 52, 81, 40, 33, 90, 85, 20, 38 and show final B tree.	10M
Q.4	Attempt any **ONE** 1) Hash the following data on a hash table of size = 11 using modulo division (aka division remainder) method which handles the collision using separate chaining. Show the final hash table. 23, 13, 21, 14, 7, 8, 10, 56, 32, 45, 55, 15 2) Sort the following numbers using shell sort. Consider gap=floor(gap/2), where gap=n and n is number of elements given for sorting. Show output in steps. 23, 13, 21, 14, 7, 8, 10, 56	05M

	0	1	2	3	4	5	6
0	0	1	0	0	1	0	0
1	1	0	1	0	1	1	0
2	0	1	0	1	0	0	1
3	0	0	1	0	0	0	1
4	1	1	0	0	0	1	0
5	0	1	0	0	1	0	1
6	0	0	1	1	0	1	0