



TKRCET
HYDERABAD
Innovation in Character, Excellence in Education

R20 Regulation
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A+' Grade)

Subject code: 3P3EE

B.Tech III Semester Supplementary Examinations, February 2024

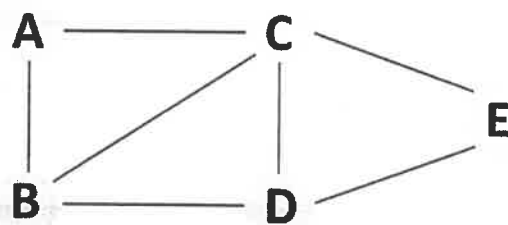
DATA STRUCTURES
(Common to CSE & CSE(AI&ML))

Maximum Marks: 70

Date: 26.02.2024 Duration: 3 hours

- Note: 1. This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A				
All the following questions carry equal marks		(10X2M=20 Marks)	CO	Bloom Tx
1	Define data abstraction.		1	L1
2	Define data structure.		1	L1
3	Discuss on linked representation of sparse matrix.		2	L2
4	What are stack operations?		2	L2
5	Define properties of binary tree.		3	L1
6	What are the applications of priority queues?		3	L2
7	Explain Linear search.		4	L2
8	Explain External sorting.		4	L2
9	Explain graph ADT.		5	L2
10	Define Red Black trees and give an example.		5	L2
Part-B				
Answer All the following questions.		(5X10M=50Marks)		
11	(a) Write a recursive algorithm to find the factorial of a number. (b) Discuss on Time and Space complexity.	5M 5M	1	L2
	OR			
12	Explain asymptotic notations.	10M	1	L2
13	Write a function to implement insert & delete operation in a single linked list.	10M	2	L3
	OR			
14	(a) Explain how stack is used in postfix expression evaluation. (b) Write functions to implement insert operations in a circular queue.	5M 5M	2	L2 L3
15	What are binary tree traversals and explain with an example.	10M	3	L3
	OR			
16	(a) Construct a max heap for the following numbers 45, 67, 23, 34, 12, 89, 66, 90	10M	3	L3
17	(a) Explain binary search. (b) Explain overflow handling methods in hashing.	5M 5M	4	L2 L2

	OR			
18	Write the Quick Sort Algorithm and Sort the following numbers 65, 45, 34, 88, 90, 76, 30, 12	10M	4	L3
19	Write DFS algorithm and apply on the following graph.  <pre> graph LR A --- C B --- C B --- D C --- E D --- E </pre>	10M	5	L3
	OR			
20	Define AVL tree and explain rotations in AVL trees.	10M	5	L3