

**Velegapudi Ramakrishna Siddhartha Engineering College::Vijayawada**

(Autonomous)

II /IV B Tech Degree Examinations(Month/Year)

Third Semester

**Department of Information Technology****20IT3303 : DATA STRUCTURES****VR20**

Time:3Hrs

**MODEL QUESTION PAPER**

Max Marks:70

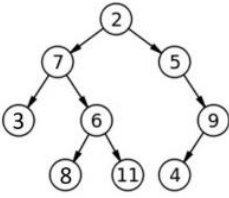
Part – A is Compulsory

Answer one (01) question from each unit of Part – B

Answers to any single question or its part shall be written at one place only

**Cognitive Levels(K): K1-Remember; K2-Understand; K3-Apply; K4-Analyze; K5-Evaluate; K6-Create**

Q. No	Question		Marks	Course Outcome	Cog. Level
Part - A			10X1=10M		
1	a	Make a comparison between a linked list and a linear array. Which one will you prefer to use and when?	1	CO2	K2
	b	What is the relevance of verification in System Life Cycle	1	CO1	K1
	c	Which Data structure used in the implementation of resource sharing? Justify.	1	CO2	K2
	d	Differentiate between Linear and Non-linear data structures	1	CO2	K2
	e	List the major types of sorting algorithms	1	CO1	K1
	f	What is BST Property	1	CO3	K1
	g	Give example for 2-3-4 tree	1	CO3	K2
	h	Differentiate between max heap and min heap	1	CO3	K2
	i	Give example for collision	1	CO1	K1
	j	What is load factor	1	CO1	K2
Part - B			4X15 =60M		
UNIT - I					
2	a	Describe indetail the binary search algorithm and discuss time complexity	7	CO1	K2
	b	Write an algorithm to sort given array of elements based on random number as pivot. Discuss time complexity.	8	CO1	K2
(OR)					
3	a	Discuss various operations on stack data structure	5	CO2	K1
	b	Write an algorithm to convert a parenthesized infix expression to postfix. Apply the algorithm and show the contents of stack during conversion for the expression: (A+B*C)*((D+E-F)/J)	10	CO2	K3
UNIT - II					
4	a	Discuss an algorithm to perform addition of two polynomials represented using suitable datastructure. Justify	8	CO4	K3
	b	Show the effect of INSERT and DELETE operations on to the Linear queue of size 10. The Linear queue sequentially contains 10, 20, 30, 40 and 50 where 10 is at front of the queue. Show diagrammatically the effect of (a). INSERT (12) (b). INSERT (34) (c). DELETE . (d) INSERT (56)	7	CO2	K2
(OR)					
5	a	Discuss various applications of queue data structure	5	CO2	K1
	b	Describe the algorithm to insert, delete the elements in single linked list	10	CO2	K2
UNIT - III					

6	a	Write Inorder, preorder and postorder traversal for the following tree.  	6	CO2	K2
	b	Describe various rotation operations on AVL Tree with examples.	9	CO3	K2
<b>(OR)</b>					
7	a	Write the algorithms for (i) Insert element in to binary search tree and (ii) Delete element from binary search tree.	8	CO3	K4
	b	Create a AVL Tree for the following data: 50, 60, 80, 30, 20, 40, 70 Can you perform the three tree traversals on AVL tree? Justify your answer.	7	CO3	K3
<b>UNIT - IV</b>					
8	a	Write the algorithms for (i) Build Max Heap and (ii) Delete max operations.	8	CO2	K3
	b	Classify various Hashing functions. Explain each of them briefly.	7	CO1	K2
<b>(OR)</b>					
9	a	Illustrate extendible hashing	5	CO1	K2
	b	Construct BTree of order 4 by considering the following elements. 5,3,21,9,1,13,2,7,10,12,4,8. Elaborate the steps in each stage. Also write your observations	10	CO3	K4

Designation	Name in Capitals	Signature with Date
Course Coordinator	Dr.G.Kalyani and V.Radhesyam	
Program Coordinator	Dr.G.Kalyani	
Head of the Department	Dr.M.Suneetha	

**VELAGAPUDI RAMAKRISHNA**  
**SIDDHARTHA ENGINEERING COLLEGE::VIJAYAWADA**  
(AUTONOMOUS)

Dt.12-06-2019

**GUIDELINES FOR FRAMING MODEL QUESTION PAPER**

The model papers for all subjects in a semester are gathered from the departments whenever a course is offered for the first time adopting new regulation. All the Heads of the Departments are requested to direct their faculty to strictly adhere to the following guidelines while framing the model question papers for the subjects of UG and PG courses in the new curriculum.

1. Questions must be covered unit-wise uniformly as per the syllabus without missing the competency.
2. The question paper shall reflect the ***Bloom's Cognitive Levels of Learning***.  
**Cognitive Levels (K): K1-Remember; K2-Understand; K3-Apply; K4-Analyze; K5-Evaluate; K6-Create**
  - ❖ The composition of question paper shall have questions at different complexity levels as listed below:

▪ Questions that can be attempted by an average student (K1 & K2)	40%
▪ Questions of intermediate complexity (K3 & K4)	40-50%
▪ Questions of design and application oriented nature (K5 & K6)	10-20%
3. Question paper is to be set conforming to the OBE pattern clearly mentioning the Course Outcomes and Bloom's Cognitive Levels against each question.
4. The questions are to be set with minimum 2 sub-questions (a) & (b) for each main question to the extent possible covering entire syllabus in the unit.
5. Specify the marks against each question / part of a question in Part B.
6. The figures, if any, may be computer aided or neatly drawn with black pen indicating clearly the values/dimensions.
7. Prepare the one mark questions in only sentence form. Answers to these questions must be unique and having short answers limited to three/four lines.

**PRINCIPAL**