Code No: R161213 **R16** SET - 1

I B. Tech. II Semester Regular Examinations, April/May - 2017
DATA STRUCTURES
(Com. to ECE, EIE, ECC)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Define polynomial ADT. (2M)
   b) List the application of stacks. (2M)
   c) Define queue full condition. (2M)
   d) Define path in a tree. (2M)
   e) What is the degree of a graph? (2M)
   f) What is planer graph? (2M)
   g) Give the time complexity of quick sort. (2M)

PART –B

2. a) Define data structure. Discuss different types of data structure their implementations applications. (7M)
   b) What is an array? Discuss different types of array with examples. (7M)

3. a) Write an algorithm for basic operations of stack. (7M)
   b) Explain the procedure to evaluate postfix expression. Evaluate the following postfix expression 7 3 4 + - 2 4 5 / + * 6 / 7 +? (7M)

4. a) Write recursive algorithm for lists. (7M)
   b) Explain the procedure to insert and delete element from sparse matrix. (7M)

5. a) Define binary search tree. Show how to insert and delete an element from binary search tree. (7M)
   b) Write algorithm to insert and delete an element from binary search tree. (7M)

6. a) What is a graph? Explain the properties of graphs. (7M)
   b) Write breadth first traversal algorithm. Explain with an example. (7M)

7. a) Rearrange following numbers using quick sort: (7M)
   10, 6, 3, 7, 17, 26, 56, 32, 72
   b) Write a program to sort the elements using radix sort. (7M)
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Code No: R161213 **R16** SET - 2

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Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Discuss operations performed with polynimials. (2M)
   b) Differentiate stack and queue. (2M)
   c) List advantages of circular linked list over single linked list. (2M)
   d) Define heap. (2M)
   e) List and explain types of graphs. (2M)
   f) List any two differences between graphs and trees. (2M)
   g) What is the time complexity of merge sort? (2M)

PART –B

2. a) Explain how to implement polynomial ADT using array. Discuss its Advantages and Disadvantages. (7M)
   b) Explain polynomial addition using arrays. (7M)

3. a) Explain the operations performed on simple queue with an example. (7M)
   b) Convert following expression X+(Y * Z) – ((N * M +O) /P) in to post form. (7M)

4. a) Write an algorithm to push and pop an element from linked stack. (8M)
   b) Discuss sparse matrix representation using linked list. (6M)

5. a) Construct max heap for the following: (7M)
   140, 80 , 30 , 20 ,10 ,40 ,30 ,60 ,100 ,70 ,160 ,50 , 130, 110, 120
   b) Explain in-order traversal of threaded binary tree with an example. (7M)

6. a) What are connected components of graph? Is there a method to find out all the connected components of graph? Explain. (7M)
   b) Explain Prim’s algorithm with an example. (7M)

7. a) Write algorithm for merge sort. (7M)
   b) Discuss how to sort elements using merge sort with suitable example. (7M)

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Code No: R161213 **R16** SET - 3

I B. Tech. II Semester Regular Examinations, April/May - 2017
DATA STRUCTURES
(Com. to ECE, EIE, ECC)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	List different ways of implement polynomial ADT.	(2M)
	b)	List the applications of queue.	(2M)
	c)	List advantages of linked list over arrays.	(2M)
	d)	Define fully binary tree.	(2M)
	e)	Define a Graph.	(2M)
	f)	Find spanning trees of a graph.	(2M)
	g)	Evaluate time complexity of insertion sort.	(2M)

PART –B

2.	a)	Define data structure. Explain different types of data structure.	(7M)
	b)	Explain representation of arrays along with their advantages and disadvantages.	(7M)
3.	a)	Explain the evaluation of prefix expression. Find the equivalent prefix of :8 6 3 + * 1 2 3 -/-	(7M)
	b)	Explain basic operations of queue. List the steps to implement queue using stack.	(7M)
4.	a)	Write an algorithm to delete an element anywhere from doubly linked list.	(7M)
	b)	Write applications of single linked list to represent polynomial expressions.	(7M)
5.	a)	What operations can be performed on binary trees? Discuss.	(7M)
	b)	Write in-order, pre-order and post-order traversal of a binary tree.	(7M)
6.	a)	Discuss kruskal's algorithm with an example.	(7M)
	b)	Explain how to represent a graphs.	(7M)
7.	a)	State and explain heap sort with example.	(7M)
	b)	Evaluate time complexity and space complexity of an algorithm.	(7M)

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Code No: R161213 **R16** SET - 4

I B. Tech. II Semester Regular Examinations, April/May - 2017
DATA STRUCTURES
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Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) Define sparse matrix. (2M)
   b) List different types of queue. (2M)
   c) State different types of linked lists. (2M)
   d) List the different tree traversals. (2M)
   e) Define spanning tree. (2M)
   f) Define in-degree and out-degree of a graph. (2M)
   g) What is the best sorting technique? Why? (2M)

PART –B

2. a) Explain sparse matrix representation using array with an example. Discuss the advantage and disadvantages of this method. (7M)
   b) Discuss matrix multiplication with an example. (7M)

3. a) Write an algorithm to insert and delete a key from circular queue. (7M)
   b) Explain the procedure to convert infix expression to postfix expression with the following expression: ((A –(B+C) * D) / (E+F)) (7M)

4. a) List various operations of linked list and explain how to insert a node anywhere in the list. (7M)
   b) Show how to reverse a single linked list. (7M)

5. a) Explain binary tree ADT. (6M)
   b) Discuss representation of binary tree using arrays and linked list. (8M)

6. a) Explain Warshall's algorithm to find transitive closure of a graph with a sutable example. (7M)
   b) Write Prim's algorithm. (7M)

7. a) State and explain insertion sort with example. (7M)
   b) Differentiate between iterative merge sort and recursive merge sort. (7M)
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