

## III Semester B.A./B.Sc. Examination, Nov./Dec. 2016 (Semester Scheme) (2014-15 only) (Repeaters) COMPUTER SCIENCE - III **Data Structures and Algorithms**

Max. Marks: 70 Time: 3 Hours Instruction: Answer all Sections.

SECTION - A Answer any 10 questions. Each questionarries 2 marks. (2×10=20) 1) Define data structure. Name any two data structure. 2) Write any two operations on primitive data structure. 3) What is a string? How is it stored in memory? 4) What is recursion? 5) What is searching? Mention the techniques of searching. 6) Write two applications of stack. 7) Convert the following infix to postfix expression.  $(A + B \wedge C) * (E/D)$ 8) What are the different types of queues? 9) Define priority queues. 10) What is a doubly linked list? 11) Define Binary tree. 12) What is meant by node and edges in a graph? SECTION - B II. Answer the following. Each question carries 10 marks. (5×10≔50)

13) a) i) Explain the classification of data structures. ii) What are the different operations performed on strings? Give examples. 5 OR b) i) Write an algorithm to delete an element in an array. 5 ii) Write a program to find  ${}^{n}C_{r}$  using recursion. P.T.O.

4) a) Explain Towers of Hanoi problem for three disks.						KS.	10
		C	)R				
b)	i) Write an algorithm to insert an element at the beginning of the linked list.						
	ii) Define queue. What are the operations performed on queues?						5 5
a)							5
	ii) Explain circular linked list.						5
		C	R				•
b)	i) Write an algorithm to evaluate postfix expression.						5
							5
a)	· · · · · · · · · · · · · · · · · · ·						5
	/1/// \ \						5
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b)	Explain bubble sort algorithm to sort the following elements.						10
	13	41	25	7	96	4	
a)	i) Explain depth first search algorithm with an example.						5
							5
				-		•	_
b)	i) Explain linked list representation of binary tree.						5
							5
	<ul><li>b)</li><li>a)</li><li>b)</li><li>a)</li></ul>	b) i) Write list. ii) Define a) i) What ii) Expla b) i) Write ii) Expla a) i) Write ii) Mentio b) Explain 13 a) i) Explain ii) Explain b) i) Explain	b) i) Write an algoralist.  ii) Define queue.  a) i) What is stack  ii) Explain circular  b) i) Write an algorali) Explain various  a) i) Write an algorali) Mention differed  b) Explain bubble state  13 41  a) i) Explain depth  ii) Explain pre-orac  b) i) Explain linked	b) i) Write an algorithm to insertist.  ii) Define queue. What are the a) i) What is stack? Explain the ii) Explain circular linked liss OR  b) i) Write an algorithm to evaluate ii) Explain various representation ii) Explain various representation ii) Mention different types of OR  b) Explain bubble sort algorithm 13 41 25  a) i) Explain depth first search ii) Explain pre-order traversation OR  b) i) Explain linked list representations.	oR b) i) Write an algorithm to insert an elember list. ii) Define queue. What are the operation ii) What is stack? Explain the operation ii) Explain circular linked list. OR b) i) Write an algorithm to evaluate postion iii) Explain various representations of iii) Explain various representations of iii) Mention different types of linked list. OR b) Explain bubble sort algorithm to sorting iii) Explain depth first search algorithm iii) Explain pre-order traversal algorithm OR b) i) Explain linked list representation of	b) i) Write an algorithm to insert an element at the list.  ii) Define queue. What are the operations perform ii) Explain circular linked list.  OR  b) i) Write an algorithm to evaluate postfix expressii) Explain various representations of graph in material ii) Mention different types of linked list with an element using iii) Mention different algorithm to sort the following the sort algorithm to sort the following the sort algorithm with an element using ii) Explain bubble sort algorithm to sort the following the sort algorithm with an element at the list.  OR  b) Explain depth first search algorithm with an element at the list.  OR  b) i) Explain linked list representation of binary trees.	DR b) i) Write an algorithm to insert an element at the beginning of the linked list.  ii) Define queue. What are the operations performed on queues?  a) i) What is stack? Explain the operations performed on the stack.  ii) Explain circular linked list.  OR b) i) Write an algorithm to evaluate postfix expression.  ii) Explain various representations of graph in memory.  a) i) Write an algorithm to search an example using linear search.  ii) Mention different types of linked list with an example.  OR b) Explain bubble sort algorithm to sort the following elements.  13 41 25 7 96 4  a) i) Explain depth first search algorithm with an example.  ii) Explain pre-order traversal algorithm with an example.