

(2007 course)

B.TECH SEM - III (COMPUTER ENGG.) : SUMMER - 2018

SUBJECT: ALGORITHMS AND DATA STRUCTURES

Day : Tuesday  
Date : 22/05/2018

S-2018-2568

Time : 02.30 PM TO 05.30 PM  
Max. Marks: 80

N. B.:

- 1) Q.1 and Q.5 are **COMPULSORY**. Out of the remaining questions attempt **ANY TWO** questions from each section.
- 2) Answers to both sections should be written in **SEPARATE** answer books.
- 3) Draw neat Sketch **WHEREVER** necessary.
- 4) Figures to right to indicate **FULL** marks.

**SECTION – I**

- Q.1** a) Define following terms with examples (04)  
i. Data Structures  
ii. ADT  
iii. Data Object  
iv. Data Type  
b) Define Queue and Write an ADT for Queue. (05)  
c) Write a pseudo code for Sparse Matrix Addition. (05)
- Q.2** a) What is ADT? Write an ADT for Stack. (07)  
b) Compare Linear Data structures vs. Nonlinear Data Structures (06)
- Q.3** a) Convert following Arithmetic expression into Postfix and Show stack status in tabular form. (07)  
$$A+(B*C-(D/E-F)*G)*H$$
  
b) What is Circular Queue? Explain its operations. (06)
- Q.4** a) Write an Algorithm for finding Transpose of Sparse matrix. (07)  
b) How polynomial represented using 2D array? Discuss for following example. (06)  
$$x^2+xy+2x^2y$$

**SECTION – II**

- Q.5** a) Compare Doubly Linked list with Circular Linked list. (05)  
b) Explain in detail characteristics of algorithm. (05)  
c) Write a pseudo code for selection sort. (04)
- Q.6** a) Write algorithm to perform basic operation on Singly linked list. (07)  
b) How to represent polynomial using GLL (06)
- Q.7** a) Write a Binary Search and Linear Search Algorithm and analyze the same to find out its worst case complexity. (07)  
b) Explain advantages of Index sequential Search over Sequential Search. (06)
- Q.8** a) Sort following data in ascending order using merge sort. (07)  
12,4,23,43,34,10,3,1,2,37  
b) Compare Quick sort and Bubble sort. (06)

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