

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-III(OLD) • EXAMINATION – WINTER 2016

Subject Code:130702

Date:04/01/2017

Subject Name:Data and File Structure

Time:10:30 AM to 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What is data structure? Explain different types of data structures with applications. **07**
- (b) Derive the formula to calculate address $A[i, j]$ of 2-D array, for a Row-major order storage representation. **07**
- A 2-D array defined as $A[r, c]$ where $1 \leq r \leq 4$, $5 \leq c \leq 8$, requires 2 bytes of memory for each element. If the array is stored in Row-major order form, calculate the address of $A[3,7]$ given the Base address as 2000.
- Q.2** (a) Discuss and compare array and linked list. **07**
- (b) Discuss importance of hashing. Also discuss one of the method of hashing with an example. **07**
- OR**
- (b) Discuss the structure of sequential and indexed file organization. **07**
- Q.3** (a) Write algorithm OR code for PUSH, POP and DISPLAY function of the STACK. **07**
- (b) Convert the following infix expression to postfix form using Stack. **07**
- $((A - (B + C)) \times D) / (E + F)$
- OR**
- Q.3** (a) Write algorithm OR code for INSERT, DELETE and DISPLAY function of the QUEUE. **07**
- (b) What is a priority queue? Discuss the array implementation of priority queue. **07**
- Q.4** (a) Write C code to insert a node at the end of a doubly link list. **07**
- (b) Write an algorithm to merge two simple link lists having initial address L1 and L2 respectively. Also write algorithm to display the list. **07**
- OR**
- Q.4** (a) Write algorithm OR code for DELETE and DISPLAY functions of Circular Link List. **07**
- (b) Write C code for the following operations for a simple link list. **07**
- i. Reverse : to reverse the link list
- ii. Max : to find the largest element from the link list.
- Q.5** (a) Write a non-recursive algorithm for Preorder traversal of a binary tree **07**
- (b) What is a sparse matrix? Explain memory representation of a sparse matrix. **07**
- OR**
- Q.5** (a) Discuss DFS and BFS. **07**
- (b) Discuss Inorder and Postorder traversal of a binary tree. **07**
