DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER IV [IT]
SUBJECT: (IT-406) DATA STRUCTURES AND ALGORITHMS

Examination	**: First Sessional**	**Seat No.**	**: _____**
Date	**: 10/01/2014**	**Day**	**: Friday**
Time	**: 11:00 to 12:15**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed. **[12]**

(a) The postfix form of the expression (A+ B)*(C*D - E)*F / G is _____ **[2]**

(b) What is the infix form of the following postfix expression? **[2]**
AB / C – DE * + AC * -

(c) A circular queue is to be implemented using an array having 5 elements. Show contents of the queue and value of rear and front variables after the following sequential operations: **[3]**
Initial state: Empty queue with rear=front=4
- add('A') (3) add('C') (5) remove() (7) remove()
- add('B') (4) add('D') (6) add('E') (8) add('F')

(d) Consider integer array int arr[4][5] declared in a program. If the base address is 1020, find the address of the element arr[3][4] with row major and column major representation of the array. **[2]**

(e) Write an algorithm to implement the operations of queue using two stacks. **[3]**

Q.2 Attempt *Any Two* from the following questions. **[12]**

(a) Write an algorithm to perform the following operations: **[6]**
(1) to reverse a linked list. (2) to erase a linked list.

(b) Two linked lists contain information of the same type in ascending order. Write a module to merge them to a single linked list that is sorted. **[6]**

(c) Write an algorithm for evaluation of a postfix expression. **[6]**

Q.3 (a) Write an algorithm for insertion and deletion in doubly circular linked list. **[6]**

(b) What are circular queues? Write down routines for inserting and deleting elements from a circular queue implemented using arrays. **[6]**

OR

Q.3 (a) Write an algorithm for push and pop operation in linked stack. **[6]**

(b) Write an algorithm for conversion of an infix expression to postfix expression. **[6]**
