

# RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

FIRST YEAR (BATCH 2015-18)

B.A./B.Sc. SECOND SEMESTER (January – June) 2016

Mid-Semester Examination, March 2016

COMPUTER SCIENCE (General)

Date : 18/03/2016

Time : 12 noon – 1 pm

Paper : II

Full Marks : 25

**[Use a separate Answer Book for each group]**

## **Group – A**

Answer **any one** question of the following :

(1 × 12.5)

1. a) Assume that 4 – bytes of storage are required to hold each element of an integer array, a[10][12]. The array begins from memory location 1001. Calculate the address of the element at a[4][5] considering column-major order. Show the calculation applying the formula. (3)  
b) Differentiate between linear and non-linear data structure with example. (2)  
c) Write an algorithm to insert an element at the front end in a deque. (5)  
d) Write one application of queue in computer science. (1)  
e) What is the advantage of a linked list over an array? (1.5)
2. a) Evaluate the following infix expression by converting it into postfix form and then evaluating the postfix expression.  
 $5 * (9 + 3) - 8/2$   
All the symbols have usual meaning. Show how stack is used in both cases. (2.5 + 3)  
b) Describe different properties of an algorithm. (2)  
c) Write an algorithm to insert an item in a single linked list in a specific position. The position is given by the user. (5)

## **Group – B**

Answer **any one** question of the following :

(1 × 12.5)

3. a) Calculate TAT and AWT for the following RR scheduling with 1ms time quantum : (4)

Process	Burst Time
P <sub>1</sub>	8
P <sub>2</sub>	6
P <sub>3</sub>	1
P <sub>4</sub>	9
P <sub>5</sub>	3

- b) What is drawback of SJF scheduling and how is it resolved? (2.5)
- c) Discuss various types of inter-process communication techniques. (4)
- d) What is Critical section problem? (2)
4. a) What are the services provided by OS? (4)  
b) Explain multiprogramming, multitasking and multiprocessing. (4.5)  
c) Write a short note on Virtual Machine. (4)