

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

FIRST YEAR

B.A./B.SC. SECOND SEMESTER (January – June) 2013

Mid-Semester Examination, March 2013

Date : 06/03/2013

COMPUTER SC. (General)

Time : 12 noon – 1 pm

Paper : II

Full Marks : 25

Group – A (Data Structure)

Answer question no.1 and any one from the rest

1. Answer any one question

2 ½

a) State the Master theorem.

b) Compare and contrast between iteration and recursion.

2. a) Define Big-Oh and Big-Omega with graphical representation and with example.

b) Solve the recurrence relation and calculate the upper bound of the function T(n) using substitution method :

$$T(n)=2T(n/2)+O(n) \text{ when } n>1$$

$$T(1)=1$$

c) Show the elements of the stack after the following series of operations:

Push(5),Push(8),Push(1),Push(4),Push(12),Push(13),Pop(),Pop(),Push(2)

Push(67),Push(12),Pop(),Pop(),Pop().

5+2+3

3. Write an algorithm to implement queue using two stacks. Is it possible to maintain n stacks in a 1:n array.

8+2

Group – B (Operating System)

Answer question no.4 and any two from the rest

4. Answer any one question

2 ½

a) What is Kernel? What are the different types of kernels?

b) Define process. Show various process states using a diagram.

5. a) What is the difference between system software and application software?

b) What is a command interpreter?

3+2

6. a) Briefly explain Context Switch?

b) What is Interprocess Communication?

3+2

7. a) What is Turn Around time?

b) Calculate average Waiting Time and average Turn Around time for the following set of processes using Round Robin scheduling with time quantum of 4 milliseconds:

Process	Burst Time
P1	6
P2	3
P3	7

c) What is preemptive and non-preemptive scheduling? 1+4

8. c) What is the Critical Section problem associated with cooperating processes?

d) What are the conditions that must satisfy to overcome critical section problem? 3+2