## RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

B.A./B.Sc. SECOND SEMESTER EXAMINATION, MAY 2014

FIRST YEAR

Computer Science (General)

Date : 30/05/2014 Time : 11 am - 1 pm

Paper : II

Full Marks : 50

## (Use separate answer books for each group)

## $\underline{Group} - \underline{A}$

An	swer	<u>any</u>	one question of the following :-	$[1 \times 5]$	
1.	a)	i)	What is recursion?	(1)	
		ii)	Explain the difference between recursion and iteration using "finding the n-th		
			fibonacci number" as an example.	(4)	
	b)	i)	What is a linked list?	(1)	
		ii)	Write down the difference(s) between a linked list and an array.	(2)	
		iii)	Write the pseudo code to insert an element into a linked list.	(2)	
An	swer	<u>any</u>	<u>two</u> questions of the following :-	[2×10]	
2.	a)	Wh	at are the properties of Binary Tree?	(2)	
	b)	Exp	plain Binary search Tree with proper example.	(2)	
	c)	Show In order, Pre order, Post order traversal of Binary search Tree with a proper example.			
3.	a)	What is a stack?			
	b)	Explain briefly with pseudo code the push (x), pop() and is empty () operations on a stack.			
	c)	Explain Depth First search as an application of the stack data structure.			
4.	a)	Explain operations of a Linear Oueue data structure with proper diagram.			
	b)	Perform the following operations on a linear queue of size 5 and show the status of the queue after each operation:			
		Inse	ert (5), Insert (6), Insert (10), Remove (), Remove (), Insert (11), Insert (12)	(4)	
	c)	Def	ine Big Oh notation.	(2)	
5.	a)	Ext	blain with pseudo code the insertion sort algorithm.	(5)	
	b)	Exp	plain with pseudo code the binary search algorithm.	(5)	
			<u>Group – B</u>		

6.	An	[1 × 5]	
	a)	Compare multiprogramming, multiprocessing and multitasking.	
	b)	Explain the necessary and sufficient condition for dead lock.	
An	swer	any two questions of the following :-	$[2 \times 10]$
7.	a)	Discuss various types of kernels.	(5)
	b)	What is context switching?	(3)
	c)	What do you mean by virtual machine?	(2)

- 8. a) Explain multilevel queue scheduling.
  - b) Consider the following set of processes as follows :

Process	Arrival Time	Burst Time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

Find average waiting time using :

- i) SJF algorithm and
- ii) FCFS algorithm
- c) What is preemptive and non-preemptive scheduling?
- 9. a) What are independent and co-operating processes?
  - b) Explain the two basic techniques of inter process communication.
  - c) What is critical section problem?
- 10. a) What is memory management?
  - b) Differentiate between logical and physical address.
  - c) What is paging?

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(5)

(2)

(3)

(5)

(2)

(3)

(4)

(3)