RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. SECOND SEMESTER TAKE-HOME TEST / ASSIGNMENT, JULY 2020

Date : 15/07/2020 **COMPUTER SCIENCE (General)**

Time : 11 am – 5 pm **Paper : II (Arrear)** Full Marks : 50

Group : A

Answer **any one** question from Question Nos. 1 & 2 : [1×5]

1. a) Compare and contrast "Recursive" and "Iterative" algorithm.
   b) Define data structure. [3 + 2]
2. a) Compare and contrast "Linear" and "Non-Linear" data structure.
   b) Write down the properties of an algorithm. [3 + 2]

Answer **any two** questions from Question Nos. 3 to 5: [2×10]

3. a) Write down "Selection Sort" algorithm.
   b) Write down "Binary Search" algorithm. [5 + 5]
4. a) Write down "Pre-order", "Post-order" and "In-order" traversal algorithms on a binary tree.
   b) Compare and contrast "BFS" and "DFS". [7.5 + 2.5]
5. a) Write an algorithm of linear searching on a "Linked List".
   b) Explain "Insertion" operation on a "Binary Search Tree" with a suitable example.
   c) Differentiate "Stack" and "Queue". [5 + 3 + 2]

Group : B

Answer **any one** question from Question Nos. 6 & 7 : [1×5]

6. Explain Belady's anomaly with example. [5]
7. What are the advantages of paging scheme in memory management? Is internal fragmentation possible in this scheme? Justify. [3+2]

Answer **any two** questions from Question Nos. 8 to 10 : [2×10]

8. a) Consider the following set of processes that need to be scheduled on a single CPU. All the times are given in milliseconds.

Process Name	Arrival Time	CPU Execution Time
P1	0	6
P2	3	2
P3	5	4
P4	7	6
P5	10	3

Calculate average turnaround time for these processes using preemptive SJF algorithm. [5]

b) Why deadlock is called a probabilistic event? [2]

c) Explain the following terms:

i) Virtual memory ii) Orphan process [1.5+1.5]

9. a) Consider the following reference string : 1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6. How many page faults will occur for optimal page replacement algorithm using four page frames? [4]

b) Explain absolute and relative path name with suitable examples. [2+2]

c) What is critical section? [2]

10. a) Explain demand paging and its necessity. [2+2]

b) Give a solution to the producer consumer problem using semaphore. [6]

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