



**WEST BENGAL STATE UNIVERSITY**

B.Sc. Honours Part-II Examination, 2020

**COMPUTER SCIENCE**

**PAPER: CMSA-IV**

Time Allotted: 2 Hours

Full Marks: 50

*The figures in the margin indicate full marks.  
Candidates should answer in their own words and adhere to the word limit as practicable.  
All symbols are of usual significance.*

**2 marks for neatness**

**Answer any *three* questions from the following**

16×3 = 48

1. (a) Define sorting and give an example. 2
- (b) Write a recursive function to sort a set of data elements using quick sort method. Show how your function works for an assumed data set of 10 elements. 5+3
- (c) Deduce the best case and worst-case time complexity of this sorting method and explain when does it occur. 3+3
  
2. (a) What do you mean by graph traversal? Give some examples and compare any two of them. 2+4
- (b) What do you mean by tree traversal? Explain the different tree traversal methods. Prove or disprove if any two traversal sequences are given, then the binary tree can uniquely be obtained. 2+5+3
  
3. (a) What do you mean by Collision Resolution? What are the different major Collision Resolution Techniques? 3+3
- (b) Write a function for insertion and searching of an element in a hashed table where collisions are resolved by Separate Chaining. 6
- (c) What are the criteria of good hash function? 4
  
4. (a) Explain the concept of Semaphore. State how the producer and consumer problem can be handled with Semaphore. 2+6
- (b) What is virtual memory? What could be the maximum size of virtual memory? 2+2
- (c) What is Thrashing? 4

5. (a) What do you mean by scheduling? What are the criteria of scheduling? 2+2  
(b) Consider the following set of four processes with CPU burst time and their arrival time in milliseconds: 4+4

Process	CPU burst time	Arrival time
P1	3	0
P2	6	2
P3	4	4
P4	6	6

Using FCFS and SRTF (Shortest Remaining Time First) algorithms perform the following:

- (i) Draw the Gantt chart  
(ii) Compute average waiting and average turnaround time
- (c) How does the performance of RR (Round-Robin) scheduling algorithm depend on the time quantum? Explain. 4
6. (a) What is the process? How does it differ from program? Illustrate process state diagram. 2+2+4  
(b) What is Process Control Block (PCB)? 3  
(c) What is virtual memory? Write the advantages of virtual memory. 2+3

**N.B. :** *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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