WEST BENGAL STATE UNIVERSITY

B.Sc. Honours/Programme 3rd Semester Examination, 2022-23

CMSHGEC03T/CMSGCOR03T-COMPUTER SCIENCE (GE3/DSC3)

Time Allotted: 2 Hours

Full Marks: 40

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.

GROUP-A

1. Answer any *four* questions from the following:

$2 \times 4 = 8$

(a) What is an interrupt?

(b) What is throughput?

(c) What is purpose of bootstrap programme?

(d) What is Context Switching?

(e) What do you mean by Internal Fragmentation?

(f) What is semaphore?

(g) What do you mean by convoy effect?

(h) What is virtual memory?

GROUP-B

Answer any *four* questions from this group

$8 \times 4 = 32$

2. (a) What is single-user and multi-user Operating System (OS) with example?

$2+2$

(b) What is the advantage of multi-user OS over single-user OS?

2

(c) What are the basic functions of OS?

2

3. Consider the following set of processes, with the length of the CPU burst time given in milliseconds:

Process	Burst Time	Priority
P1	2	2
P2	1	1
P3	8	4
P4	4	2
P5	5	3

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0.

    (a) Draw four Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF, non-preemptive priority (a larger priority number implies a higher priority) and RR (quantum = 2).   4

    (b) What is the turnaround time of each process for each of the scheduling algorithms in part (a)?   4

4. (a) Explain the major principles of demand paging with a proper block diagram.   5+3

    (b) What do you mean by page fault?

5. (a) Explain process states and their transition (from one state to another) with a suitable diagram.   5+3

    (b) Differentiate between process and thread.

6. (a) What are the four necessary conditions for deadlock?   4+4

    (b) Explain banker's algorithm for deadlock avoidance.

7.   Write short notes on the following: 2×4 = 8

    (a) FIFO Scheduling Algorithm

    (b) Interrupt

    (c) Segmentation

    (d) Fragmentation.

8. (a) What is the difference between logical and physical address?   2+3+3

    (b) Explain the difference between preemptive and non-preemptive scheduling.

    (c) Describe the process control block.

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