



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours/Programme 3rd Semester Examination, 2019



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: 2×4 = 8
- (a) Under what circumstances would a user be better off using a time-sharing system, rather than a personal computer or single-user workstation?
 - (b) What is multi-processing system?
 - (c) What is non pre-emptive scheduling?
 - (d) What is virtual memory?
 - (e) What is deadlock?
 - (f) What is meant by Dispatch latency?
 - (g) Define thread.

GROUP-B

Answer any four questions from the following 8×4 = 32

2. (a) What do you mean by a process? 2
- (b) Design and describe a two state and five state process transition diagram. 2+4
3. (a) What is Semaphore? 2
- (b) How a semaphore can be used to solve a producer-consumer problem of processes? 4
- (c) What is Race Condition? 2
4. (a) Why the page size in paging is always a power of 2? 2
- (b) What do you mean by External Fragmentation? 2
- (c) Design and describe the paging technique for memory management. 4

5. (a) What are the necessary and sufficient conditions for deadlock to occur? 3
 (b) When a system is called 'is in a safe state'? Discuss it with a suitable example. 3
 (c) Define Belady's Anomaly. 2

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

| Process | Burst Time | Priority |
|---------|------------|----------|
| P_1 | 10 | 3 |
| P_2 | 1 | 1 |
| P_3 | 2 | 3 |
| P_4 | 1 | 4 |
| P_5 | 5 | 2 |

The processes are assumed to have arrived in the order P_1, P_2, P_3, P_4, P_5 , all at time 0.

- (a) Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a non-preemptive priority (a smaller priority number implies a higher priority,) and RR (quantum = 1) scheduling. 4
 (b) What is the turnaround time of each process for each of the scheduling algorithms in part (a)? 4
7. (a) What is the difference between paging and segmentation? 3
 (b) Define Dynamic Loader and Dynamic Linker. 3
 (c) What is TLB? 2
8. Write short notes on: (any *two*) 4×2 = 8
 (a) PCB
 (b) Thrashing
 (c) Batch processing system.

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