

Roll No.

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Paper ID [A0303]

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B.Sc. IT (05) - 103 B.Sc. CST - 404 (Old) (Sem. - 1st)**B.Sc. IT - 201 (Old) / 302 (New) / DCA - 204 (New)****OPERATING SYSTEM****Time : 03 Hours****Maximum Marks : 75****Instruction to Candidates:**

- 1) Section -A is **Compulsory**.
- 2) Attempt any **Nine** questions from Section - B.

Section - A**(15 × 2 = 30)****Q1)**

- a) What are the two main functions of an operating system?
- b) What is the principal disadvantage of too much multiprogramming?
- c) What is starvation? How it is removed in priority scheduling?
- d) Differentiate user level threads from kernel level threads.
- e) What is binary semaphore and why it is used?
- f) Which is the best condition to prevent from a deadlock?
- g) Define the concept of dynamic loading.
- h) What is compaction and why it is used?
- i) What is Belady's anomaly problem?
- j) What is the difference between local page replacement and global page replacement?
- k) How interrupt differ from trap?
- l) Differentiate record, file and directory.
- m) What is indexed access?
- n) What is the purpose of system call?
- o) How scheduler differ from dispatcher?

Section - B**(9 × 5 = 45)**

Q2) What is operating system? Explain different functions of operating system.

Q3) Explain different types of scheduling queues and types of schedulers.

Q4) Consider the following set of processes, with the length of CPU-burst time given in milliseconds :

| <u>Process</u> | <u>Burst Time</u> | <u>Priority</u> |
|----------------|-------------------|-----------------|
| P1 | 10 | 3 |
| P2 | 29 | 1 |
| P3 | 3 | 3 |
| P4 | 7 | 4 |
| P5 | 12 | 2 |

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

- (a) What is the turnaround time of each process for using FCFS, SJF, a nonpreemptive priority (a smaller priority number implies a higher priority) and RR (quantum = 10) scheduling.
- (b) What is the waiting time of each process for each of the scheduling algorithm in part a.

Q5) Explain Dining Philosopher problem in process synchronization.

Q6) What are the four necessary conditions to occur a deadlock? Explain bankers algorithm.

- Q7)** (a) Why are page sizes always powers of 2?
 (b) Consider a logical address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames. How many bits are there in the logical address and physical address?

Q8) Explain the segmentation memory management scheme in detail.

Q9) What is the cause of thrashing? How it occur and explain different methods to prevent from thrashing.

Q10) Consider the following page reference string :

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1.

How many page faults would occur for the following replacement algorithms, assuming three frames? Remember that all frames are initially empty,

- (a) LRU replacement.
- (b) FIFO replacement.
- (c) Optimal replacement.

Q11) Explain the different operations performed on files.

Q12) Explain Direct Memory Access and steps in a DMA transfer.

Q13) Compare parallel processor systems with distributed systems.

