

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION MO/22)

CLASS: B.TECH
BRANCH: ECE/MEC

SEMESTER : V
SESSION : MO/22

SUBJECT: CS303/211 OPERATING SYSTEM

TIME: 03 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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- Q.1(a) Define the goal of an operating system. [2]
Q.1(b) Explain the terms : [3]
(I) Real time System (II) Distributed System
Q.1(c) What do you mean by scheduler? Describe the difference between long term, short term and medium-term scheduler. [5]

- Q.2(a) Explain the states of process transitions. [2]
Q.2(b) Under what circumstances user level threads is better than kernel level threads? [3]
Q.2(c) Suppose that the following processes arrive for execution at the times indicated. Each process will run the listed amount of time in ms.

Process	Arrival Time	CPU Burst Time
P1	0	8
P2	1	4
P3	2	9
P4	3	2
P5	10	2
P6	13	3

- Calculate the average waiting time and average Turn-around time to apply SRT (Shortest Remaining Time) and SPN (Shortest Process Next) algorithms. [5]
- Q.3(a) What are critical sections? [2]
Q.3(b) What are the four necessary and sufficient conditions to occur deadlock? [3]
Q.3(c) Explain deadlock avoidance with suitable example using banker's algorithm. [5]
- Q.4(a) Explain the difference between logical and physical addresses? [2]
Q.4(b) How one solves the problem of fragmentation? [3]
Q.4(c) Consider the following page reference string. 1,2,3,4,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2. [5]
How many page faults would occur for the FIFO and LRU replacement algorithms, assuming four frames are allocated?
- Q.5(a) What is the difference between file and database? [2]
Q.5(b) What are methods of free space management of Disk? [3]
Q.5(c) Suppose a disk drive has 400 cylinders , numbered 0 to 399. The driver is currently serving a request at cylinder 143 and previous request was at cylinder 125 .The queue of pending request in FIFO order is: 86,147,312,91,177,48,309,222,175,130. Calculate the head movement for the FCFS, SSTF, SCAN and LOOK disk scheduling algorithm. [5]