

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular & Supplementary Summer 2024

Course: B. Tech.

Branch : Computer and Allied

Semester: IV

Subject Code & Name: BTCOC402

Operating Systems

Max Marks: 60

Date: 14/06/2023

Duration: 3 Hr.

Instructions to the Students:

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
3. Write proper Syntax, example and program wherever necessary.
4. Assume suitable data wherever necessary and mention it clearly.

(Level/CO)	Marks
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Q. 1 Solve Any Two of the following.

12

- | | | | |
|----|---|----------------------|----------|
| A) | Explain operating services with respect to programs and users. | Remember | 6 |
| B) | Explain Real time operating system with its types, advantages and examples. | Synthesis | 6 |
| C) | Explain microkernel type operating system structure. | Understanding | 6 |

Q.2 Solve Any Two of the following.

12

- | | | | |
|----|---|----------------------|----------|
| A) | What is thread? Differentiates between user level thread and kernel level thread. | Synthesis | 6 |
| B) | What is inter- process communication in operating System? Explain its types. | Understanding | 6 |
| C) | Consider the set of 5 processes whose arrival time and burst time are given below | Apply | 6 |

Process	Arrival Time	Burst Time	Priority
P1	0	4	2
P2	1	3	3
P3	2	1	4
P4	3	5	5
P5	4	2	5

If the CPU scheduling policy is priority preemptive, calculate the average waiting time and average turnaround time. (Higher priority number represents higher priority).

Q. 3 Solve Any Two of the following.

12

- | | | |
|--|-----------------|---|
| A) Illustrate Peterson's Solution for critical section problem. | Analysis | 6 |
| B) How the readers and writers problem can be solved using semaphore? | Evaluate | 6 |

- C) Considering a system with five processes P0 through P4 and three resources of type A, B, C. Resource type A has 10 instances, B has 5 instances and type C has 7 instances. Suppose at time t following snapshot of the system has been taken: Find...

Apply

6

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

- What will be the content of the Need matrix?
- Is the system in a safe state? If Yes, then what is the safe sequence?

Q.4 Solve Any Two of the following.

12

- A) What is demand paging? Explain the steps in handling page fault using appropriate diagram.

Remember

6

- B) Write short on:

Knowledge

6

- Working set model.
- Fragmentation

- C) Assume three frames and consider the reference page string below.

Application

6

Reference page string: 5, 7, 6, 0, 7, 1, 7, 2, 0, 1, 7, 1, 0

Determine the number of page faults using optimal and least recently used page replacement algorithm. State which algorithm is most efficient?

Q. 5 Solve Any Two of the following.

12

- A) Explain the linked allocation type disk free space management.

Remember

6

- B) Explain the contiguous and indexed file allocation methods.

Analysis

6

- C) Explain following disk scheduling techniques with its advantages ...

Understanding

6

- Shortest Seek Time First

- SCAN

***** End *****