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BCS/BIS654B

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025

**Fundamental of Operating Systems**

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. M : Marks, L: Bloom's level, C: Course outcomes.

Module – 1			M	L	C															
Q.1	a.	What are system calls? List and explain the different types of system calls.	10	L2	CO1															
	b.	Explain the different reviews of operating systems.	10	L2	CO1															
OR																				
Q.2	a.	Define operating system and explain the dual mode of operating system.	6	L2	CO1															
	b.	With neat diagram, explain computer system organization and operation.	8	L2	CO1															
	c.	List and explain the user and operating system interface.	6	L2	CO1															
Module – 2																				
Q.3	a.	Define process and its states with neat diagram.	6	L2	CO2															
	b.	What is thread? How it is different from process.	6	L2	CO2															
	c.	What is multithread process and explain the benefits of multithreading process.	8	L2	CO2															
OR																				
Q.4	a.	Explain the different types of inter process communication with neat diagram.	8	L2	CO2															
	b.	Explain different multi threading model. With their advantages and disadvantages.	6	L2	CO2															
	c.	Explain the Process Control Block (PCB) with neat diagram.	6	L2	CO2															
Module – 3																				
Q.5	a.	Calculate the average waiting time and average turns around time using preemptive SJF, FCFS algorithms. <table><tr><td>Prons</td><td>Arrival time</td><td>Burst time</td></tr><tr><td>P<sub>1</sub></td><td>0</td><td>9</td></tr><tr><td>P<sub>2</sub></td><td>1</td><td>4</td></tr><tr><td>P<sub>3</sub></td><td>2</td><td>9</td></tr><tr><td>P<sub>4</sub></td><td>3</td><td>5</td></tr></table>	Prons	Arrival time	Burst time	P <sub>1</sub>	0	9	P <sub>2</sub>	1	4	P <sub>3</sub>	2	9	P <sub>4</sub>	3	5	10	L3	CO3
Prons	Arrival time	Burst time																		
P <sub>1</sub>	0	9																		
P <sub>2</sub>	1	4																		
P <sub>3</sub>	2	9																		
P <sub>4</sub>	3	5																		
	b.	Explain Readers writers problem and their solutions using semaphore.	10	L2	CO3															



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OR													
Q.6	a.	Explain critical section problem and discuss Peterson solution.	10	L2	CO3								
	b.	Calculate average waiting time for the gives set of process with Round Robin algorithm. <table border="1"><thead><tr><th>Process</th><th>Brust time</th></tr></thead><tbody><tr><td>P<sub>1</sub></td><td>24</td></tr><tr><td>P<sub>2</sub></td><td>3</td></tr><tr><td>P<sub>3</sub></td><td>3</td></tr></tbody></table> <p>Time quantum = 4 ms Assume that all the process enters the outer at t = 0</p>	Process	Brust time	P <sub>1</sub>	24	P <sub>2</sub>	3	P <sub>3</sub>	3	5	L3	CO3
Process	Brust time												
P <sub>1</sub>	24												
P <sub>2</sub>	3												
P <sub>3</sub>	3												
	c.	Explain producer consumer problem and solution using semaphore.	5	L2	CO3								
Module – 4													
Q.7	a.	What is deadlock and what are the necessary conditions for dead lock to occur.	10	L2	CO4								
	b.	Explain different methods and algorithm used to avoid deadlock.	10	L2	CO4								
OR													
Q.8	a.	With neat diagram, explain the structure of page table any two.	10	L2	CO4								
	b.	What is paging? Explain with neat diagram paging hardware with TLB.	10	L2	CO4								
Module – 5													
Q.9	a.	What is demand paging? Explain the steps in handling page pattern using neat diagram.	8	L2	CO5								
	b.	Explain various directory structures with neat diagram.	8	L2	CO5								
	c.	Discuss need for page replacement and different page replacement methods.	4	L2	CO5								
OR													
Q.10	a.	What is file? Explain the file mounting.	6	L2	CO5								
	b.	Explain different allocations method.	8	L2	CO5								
	c.	Write a note on File Sharing.	6	L2	CO5								

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