Semester: 3rd	Department of AIML&CES-AIML	AY: 2026-27
Course Code: 1BCS304	Course Name: Operating Systems	

Question Bank

Q.	Module-01	M	L	C
1.	Explain the functions of an operating system with a neat block diagram.	10	L2	CO1
2.	Describe the structure of an operating system and explain its major components.	10	L2	CO1
3.	Explain computer system organization and the role of device controllers.	10	L2	CO1
4.	Describe interrupt handling mechanism in an operating system.	10	L2	CO1
5.	Explain I/O structure and DMA with suitable diagrams.	10	L2	CO1
6.	Explain storage hierarchy and its significance in modern computer systems.	10	L2	CO1
7.	Compare single-processor, multiprocessor, and clustered systems.	10	L2	CO1
8.	Explain multiprogramming and time-sharing operating systems.	10	L2	CO1
9.	Describe the bootstrap process and system startup sequence.	10	L2	CO1
10.	Explain different operating system structures with advantages and disadvantages.	10	L2	CO1
	Module-02			
11.	Explain the process concept and process states with a diagram.	9	L2	CO2
12.	Describe Process Control Block (PCB) and its contents.	10	L2	CO2
13.	Explain long-term, medium-term and short-term schedulers.	10	L2	CO2
14.	Explain scheduling queues and process scheduling flow.	10	L2	CO2
15.	Compare preemptive and non-preemptive scheduling algorithms.	10	L2	CO2
16.	Given a set of processes, compute waiting and turnaround times using FCFS scheduling. Process Arrival Time (ms) Burst Time (ms) P1 0 5 P2 2 3 P3 4 6 P4 6 2	10	L3	CO2
17.	Apply SJF and Priority scheduling algorithms for a given problem.	10	L3	CO2

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	Process Arrival Time (ms) Burst Time (ms) P1 0 7 P2 2 4 P3 4 1 P4 5 4			
18.	Solve a CPU scheduling problem using Round Robin algorithm and analyze the results. Process Arrival Time (ms) Burst Time (ms) P1 0 10 P2 1 5 P3 2 8 P4 3 6 Time Quantum = 3 ms	10	L2	CO2
19.	Explain context switching and its overheads.	10	L2	CO2
20.	Explain inter-process communication (IPC) models with examples.	10	L2	CO2
	Module-03			
21.	Explain race condition with a suitable example.	10	L2	CO3
22.	Describe the critical section problem and its requirements.	10	L2	CO3
23.	Explain Peterson's solution and prove that it satisfies mutual exclusion.	10	L2	CO3
24.	Explain hardware-based synchronization using Test-and-Set instruction.	10	L2	CO3
25.	Explain semaphore concepts and operations with examples.	10	L2	CO3
26.	Explain the producer–consumer problem using semaphores.	10	L2	CO3
27.	Explain deadlock characterization and necessary conditions for deadlock.	10	L2	CO3
28.	Describe deadlock prevention techniques with examples.	10	L2	CO3
29.	Explain deadlock avoidance using Banker's algorithm.	10	L2	CO3
30.	Explain deadlock detection and recovery methods.	10	L2	CO3
	Module-04			
31.	Explain logical and physical address space with address translation.	10	L2	CO4
32.	Describe contiguous memory allocation techniques and fragmentation.	10	L3	CO4

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33.	Explain paging technique with address translation mechanism.	10	L3	CO4
34.	Explain segmentation and compare it with paging.	10	L3	CO4
35.	Explain virtual memory and demand paging.	10	L3	CO4
36.	Solve a page replacement problem using FIFO algorithm. 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2	10	L3	CO4
37.	Solve a page replacement problem using LRU and Optimal algorithms. 2, 3, 2, 1, 5, 2, 4, 5, 3, 2, 5, 2	10	L3	CO4
38.	Compare FIFO, LRU, and Optimal page replacement algorithms.	10	L2	CO4
39.	Explain thrashing and methods to handle it.	10	L2	CO4
40.	Explain memory protection and sharing mechanisms.	10	L2	CO4
Module-05				
41.	Explain file concept, attributes, and file operations.	10	L2	CO5
42.	Describe file access methods and their applications.	10	L2	CO5
43.	Explain directory structures with advantages and disadvantages.	10	L2	CO5
44.	Explain file allocation methods and free space management.	10	L2	CO5
45.	Describe file system implementation architecture.	10	L2	CO5
46.	Explain disk structure and disk attachment methods.	10	L2	CO5
47.	Explain disk scheduling algorithms with performance comparison.	10	L2	CO5
48.	Describe goals and principles of protection in operating systems.	10	L2	CO5
49.	Explain domain of protection and access rights.	10	L2	CO5
50.	Explain the access matrix model for protection with examples.	10	L2	CO5

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