Department of CSE

B.Tech Mid Question Bank (R22 Regulation)

Academic Year: 2024-25   Semester: IV

### Subject Name: OPERATING SYSTEMS (22CS403PC)

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PART-A

Q.No	Questions	Marks	BL	CO	Unit No
MID-I Questions					
1	What Is An Operating System?	2	L1	CO1	I
2	List The Types of Operating Systems Based on Their Structure.	2	L1	CO1	I
3	Define A System Call in The Context of An Operating System	2	L1	CO1	I
4	Identify various types of system components?	2	L3	CO1	I
5	Differentiate between Program and Process.	2	L2	CO1	I
6	Explain the Process state diagram.	2	L2	CO1	I
7	Define Scheduling Criteria.	2	L1	CO2	II
8	List Two Types Of CPU Scheduling Algorithms.	2	L1	CO2	II
9	Differentiate Between Wait and Waitpid.	2	L2	CO2	II
10	What Is a Resource Allocation Graph?	2	L1	CO2	II
11	Plan the necessary Condition for a Deadlock	2	L3	CO2	II
12	Explain Turnaround Time and waiting time?	2	L2	CO2	II
13	What Are the Three Conditions That a Solution To The Critical Section Problem Must Satisfy?	2	L1	CO3	III
14	Name Two Classical Synchronization Problems.	2	L1	CO3	III
15	Explain Semaphores.	2	L1	CO3	III
MID-II Questions					
16	Differentiate Between Shared Memory And Message Queues.	2	L2	CO3	III
17	Explain the Inter-process Communication Mechanisms	2	L2	CO3	III

18	Describe Inter-process communication models	2	L3	CO3	III
19	Explain Logical and Physical Address Spaces.	2	L2	CO4	IV
20	Illustrate the Swapping In Memory Management?	2	L2	CO4	IV
21	Define A Page Fault.	2	L1	CO4	IV
22	Identify the List of various contiguous memory allocations and explain anyone.	2	L3	CO4	IV
23	What is Virtual Memory? What are the Benefits of having Virtual Memory.	2	L1	CO4	IV
24	List out the Page Replacement Algorithms.	2	L1	CO4	IV
25	What Are the Three Main Access Methods for Files?	2	L1	CO5	V
26	Differentiate Between Read and Write System Calls.	2	L2	CO5	V
27	Explain file system structure.	2	L1	CO5	V
28	List the File Allocation Methods.	2	L1	CO5	V
29	Describe the Free Space Management?	2	L3	CO5	V
30	Compare the open( ),close() System call?	2	L2	CO5	V
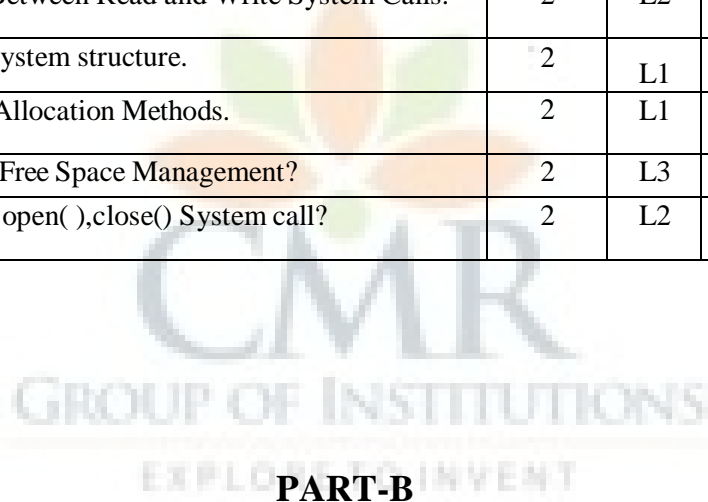
PART-B

MID-I Questions					
1	Compare The Features of a Time-Shared System and A Multiprogramming System.	4	L2	CO1	I
2	Write in detail about the services of OS.	4	L2	CO1	I
3	Explain OS Structure with neat diagram	4	L2	CO1	I
4	Describe The Structure of a Simple Batch Processing System.	4	L4	CO1	I
5	Discuss about the Process Control Block.	4	L3	CO1	I
6	Analyze The Differences Between a Personal Computer Operating System and A Distributed Operating System.	4	L3	CO1	I
7	Explain the various types of Operating Systems in detail.	8	L2	CO1	I
8	Discuss about process concept and scheduling	8	L3	CO1	I
9	Define thread and explain about various types of thread in detail	8	L2	CO1	III

10	What is CPU scheduling algorithms, discuss the scheduling criteria in detail.	4	L2	CO2	II
11	Illustrate the Banker's Algorithm in deadlock avoidance.	4	L4	CO2	II
12	Discuss Process Management System Calls-fork, exit, wait, wait pid, exec	4	L3	CO2	II
13	Define Deadlock. Explain necessary Conditions for Deadlock	4	L2	CO2	II
14	Discuss about the Deadlock Prevention	4	L3	CO2	II
15	Compare the Deadlock Recovery and prevention	4	L5	CO2	II
16	Consider the following five processes =(P1,P2,P3,P4,P5) with Arrival times = (0,0, 2, 3, 5) and Burst Time = (9, 8, 4, 2, 4) respectively. Find average waiting time and average turnaround time for the above processes using pre-emptive version of SJF/FIFO CPU scheduling algorithm	8	L3	CO2	II
17	Consider the following five processes =(P1, P2,P3,P4,P5) with Arrival times =(0,2,3,4,7) and Burst Time=(9,8,4,6, 8) respectively. Find average waiting time and average turnaround time for the above processes using Round Robin CPU Scheduling algorithm. Use time quantum / time slice=3.	8	L3	CO2	II
18	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 t0 following snapshot of the system has been taken: 	PROCESS	ALLOCATION A B C	MAX A B C	AVAILABLE A B C
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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	| a) What will be the content of the Need matrix? b) Is the system in a safe state? If yes, then what is the safe sequence? c) What will happen if process P1 requests one additional instance of resource type A andtwo instances of resource type C? d) If process P4 requests [3 3 0] resource, can it be granted or not?	8	L3	CO2	II

19	Describe Necessary conditions for solution to Critical Section Problem	4	L2	CO3	III
20	Explain the classical problems of synchronization.	4	L3	CO3	III
21	Discuss Semaphore Implementation	4	L3	CO3	III
22	Explain Synchronization Hardware	4	L2	CO3	III
23	Explain critical regions in process management and synchronization.	4	L2	CO3	III
MID-II Questions					
24	Describe Inter-process communication models in detail	4	L6	CO3	III
25	Explain the Inter-process Communication Mechanisms in detail.	4	L2	CO3	III
26	Discuss about the Inter process Communication Between Processes on different computer systems.	4	L3	CO3	III
27	Explain in detail of message queues and shared memory.	4	L3	CO3	III
28	Explain Inter process Communication with using pipes.	4	L2	CO3	III
29	Differentiate between Logical and Physical Address in Operating System	4	L3	CO4	IV
30	Discuss Swapping with a neat diagram	4	L6	CO4	IV
31	Explain swapping in memory management.	4	L2	CO4	IV
32	Consider the following page references: 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. Find no of page faults when FIFO is implemented. Use 3 frames.	4	L3	CO4	IV
33	Explain the various page replacement strategies	4	L3	CO4	IV
34	Briefly Explain Dynamic Partitioning	4	L2	CO4	IV
35	Explain Demand Paging in detail	8	L2	CO4	IV
36	Explain Segmentation with Paging in detail	8	L3	CO4	IV
37	Illustrate the Optimal Page Replacement Algorithm with an example.	8	L5	CO4	IV
38	Describe the various File operations	4	L2	CO5	V
39	Discuss about the protection of files	4	L3	CO5	V
40	Briefly describe the File System Structure	4	L2	CO5	V
41	Describe the memory file system structures	4	L4	CO5	V
42	Explain Indexed file allocation method with neat diagram.	4	L4	CO5	V
43	Briefly describe the Layered file system	4	L2	CO5	V
44	Explain the various directory structures supported by OS	8	L3	CO5	V

45	List out the Free Space Management techniques and explain any one.	8	L4	CO5	V
46	Discuss usage of open, create, read, write, close, lseek, stat, ioctl System Calls with Syntaxes	8	L4	CO5	V