

Department of CSE(AI&ML)

B.Tech Mid Question Bank (R22 Regulation)

Academic Year: 2024-25

Semester: III

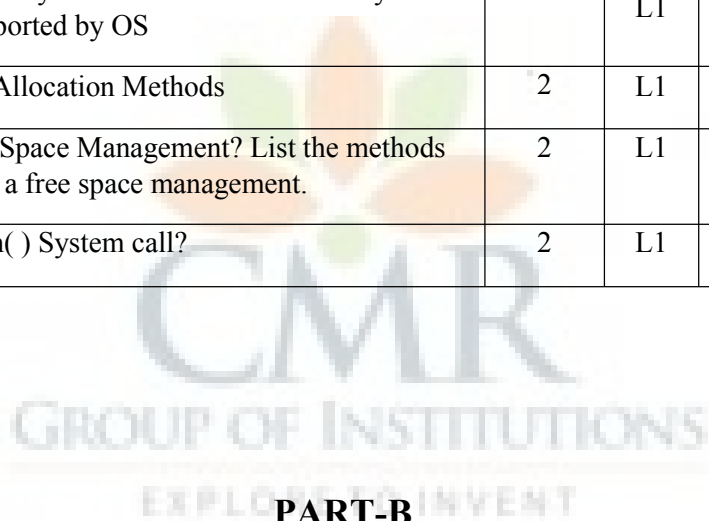
Subject Name: OPERATING SYSTEMS (22AM305PC)

Faculty Name: Syeda Sumaiya Afreen

PART-A

MID-I Questions					
Q.No	Questions	Marks	BL	CO	Unit No
1	Define Operating System. List out the objectives of an operating system.	2	L1	CO1	I
2	What are the types of System calls?	2	L1	CO1	I
3	Differentiate between Program and Process.	2	L1	CO1	I
4	List the states of Process state diagram	2	L1	CO1	I
5	Define Threads. List the types of threads	2	L1	CO1	I
6	List the System Components of Operating System	2	L1	CO1	I
7	What is Convoy effect in FCFS	2	L1	CO2	II
8	What is Turnaround Time?	2	L1	CO2	II
9	List the Approaches to Multiple - Processor Scheduling	2	L1	CO2	II
10	What is Deadlock? List the Necessary Conditions for Deadlock.	2	L1	CO2	II
11	What are the methods for handling deadlocks	2	L1	CO2	II
12	What is Deadlock avoidance? What are the two methods to achieve it?	2	L1	CO2	II
13	What is Process Synchronization	2	L1	CO3	III
14	What are Semaphores? List the types of Semaphores	2	L1	CO3	III
15	List the 3 Classical problems of process synchronization.	2	L1	CO3	III
MID-II Questions					
16	What is Inter process communication?	2	L1	CO3	III
17	List the 4 mechanisms to carry out the Inter Process Communication	2	L1	CO3	III

18	What is FIFO ?	2	L1	CO3	III
19	What is Contiguous Memory Allocation. List the types of contiguous memory allocation	2	L1	CO4	IV
20	Define Paging	2	L1	CO4	IV
21	Define Segmentation	2	L1	CO4	IV
22	What is Virtual Memory ? What are the Benefits of having Virtual Memory	2	L1	CO4	IV
23	What is Demand Paging	2	L1	CO4	IV
24	What is Page replacement? List the Page Replacement Algorithms	2	L1	CO4	IV
25	What is a File? List the attributes of File .	2	L1	CO5	V
26	List the file access methods	2	L1	CO5	V
27	What is Directory structure? list the Directory structure supported by OS	2	L1	CO5	V
28	List the File Allocation Methods	2	L1	CO5	V
29	What is Free Space Management? List the methods to implement a free space management.	2	L1	CO5	V
30	What is open() System call?	2	L1	CO5	V



PART-B

MID-I Questions					
1	Explain functionalities of OS.	4	L2	CO1	I
2	Explain the types of system calls	4	L2	CO1	I
3	Explain OS Structure with neat diagram	4	L2	CO1	I
4	Differentiate between the types of schedulers	4	L4	CO1	I
5	Explain Context Switch with a neat diagram.	4	L2	CO1	I
6	What are threads? Explain the 3 Multithreading Models	4	L2	CO1	I
7	Explain the types of Operating Systems	8	L2	CO1	I
8	Explain System call in Detail with a neat diagram	8	L2	CO1	I
9	What is Inter Process Communication(IPC)? Explain	8	L2	CO1	I

	the reasons and methods of IPC in detail.																																																																									
10	What is CPU scheduling algorithms, discuss the scheduling criteria in detail.	4	L2	CO2	II																																																																					
11	What is CPU scheduling algorithms.Explain FCFS with Advantages and disadvantages.	4	L2	CO2	II																																																																					
12	Discuss Process Management System Calls-fork, exit, wait, wait pid, exec	4	L2	CO2	II																																																																					
13	Define Deadlock. Explain necessary Conditions for Deadlock	4	L2	CO2	II																																																																					
14	Discuss Deadlock Prevention	4	L2	CO2	II																																																																					
15	Discuss Deadlock Recovery	4	L2	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	<p>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:</p> <table border="1" data-bbox="341 1422 901 1646"> <thead> <tr> <th rowspan="2">PROCESS</th> <th colspan="3">ALLOCATION</th> <th colspan="3">MAX</th> <th colspan="3">AVAILABLE</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>A</th> <th>B</th> <th>C</th> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>P0</td> <td>0</td> <td>1</td> <td>0</td> <td>7</td> <td>5</td> <td>3</td> <td>3</td> <td>3</td> <td>2</td> </tr> <tr> <td>P1</td> <td>2</td> <td>0</td> <td>0</td> <td>3</td> <td>2</td> <td>2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>P2</td> <td>3</td> <td>0</td> <td>2</td> <td>9</td> <td>0</td> <td>2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>P3</td> <td>2</td> <td>1</td> <td>1</td> <td>2</td> <td>2</td> <td>2</td> <td></td> <td></td> <td></td> </tr> <tr> <td>P4</td> <td>0</td> <td>0</td> <td>2</td> <td>4</td> <td>3</td> <td>3</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>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?</p>	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				8	L3	CO2	II
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19	Describe Necessary conditions for solution to Critical Section Problem	4	L2	CO3	III
20	Explain the Readers-Writers problem	4	L2	CO3	III
21	Discuss Semaphore Implementation	4	L2	CO3	III
MID-II Questions					
22	Discuss Peterson's solution	4	L2	CO3	III
23	Explain Synchronization Hardware	4	L2	CO3	III
24	Explain Dining Philosophers problem in detail	4	L2	CO3	III
25	Differentiate between Logical and Physical Address in Operating System	4	L2	CO4	IV
26	Discuss Swapping with a neat diagram	4	L2	CO4	IV
27	Describe Paging hardware with TLB with a neat diagram	4	L2	CO4	IV
28	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
29	Given six memory partitions of 300KB, 600KB, 350KB, 200KB, 750KB, and 125KB in order. How would the first-fit and best-fit algorithms place process of size 115KB, 500KB, 358KB, 200KB, and 375KB in order?	4	L3	CO4	IV
30	Briefly Explain Dynamic Partitioning	4	L2	CO4	IV
31	Explain Demand Paging in detail	8	L2	CO4	IV
32	Explain Segmentation with Paging in detail	8	L2	CO4	IV
33	Explain Optimal Page Replacement Algorithm with an example	8	L3	CO4	IV
34	Describe the various File operations	4	L2	CO5	V
35	Discuss about the protection of files	4	L2	CO5	V
36	Briefly describe the File System Structure	4	L2	CO5	V
37	Describe In-memory file-system structures	4	L2	CO5	V
38	Explain Indexed file allocation method with neat diagram.	4	L2	CO5	V
39	Briefly describe the Layered file system	4	L2	CO5	V
40	Explain the various directory structures supported by OS	8	L2	CO5	V
41	Explain Free Space Management techniques.	8	L2	CO5	V

42	Discuss usage of open, create, read, write, close, lseek, stat, ioctl System Calls with Syntaxes	8	L2	CO5	V
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