

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)**

**CLASS: B.TECH.
BRANCH: AIML**

**SEMESTER : V/ADD
SESSION : MO/2025**

SUBJECT: CS362 OPERATING SYSTEM CONCEPTS

TIME: 02 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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		CO	BL												
Q.1(a) How does the distinction between kernel mode and user mode function as a rudimentary form of protection (security)?	[2]	1	2												
Q.1(b) Which of the following instructions should be privileged?	[3]	1	3												
<ol style="list-style-type: none"> 1. Set value of a timer 2. Read the clock 3. Clear memory 4. Issue a trap instruction 5. Turn of interrupts 6. Modify entries in device-status table 7. Switch from user to kernel mode 8. Access I/O device 															
Q.2(a) List 3 reasons for process creation and 5 reasons for process termination.	[2]	2	1												
Q.2(b) Presenting a two-state process model and a five-state process model, justify, how five-state process model became necessary with the evolution of Operating system?	[3]	2	4												
Q.3(a) Give any 4 reasons for process suspension.	[2]	2	1												
Q.3(b) With the help of process state transition diagram with suspend states, explain the following transition:	[3]	2	3												
<ol style="list-style-type: none"> 1. Blocked → Blocked/Suspend 2. Blocked/Suspend → Ready/suspend 3. Blocked/Suspend → Blocked 															
Q.4(a) Briefly explain what these scheduling decides. Long-term scheduling, Medium-term scheduling and Short-term scheduling	[2]	2	1												
Q.4(b) With the help of appropriate diagram show the nesting of scheduling functions.	[3]	2	2												
Q.5 Suppose that the following processes arrive for execution at the times indicated. Each process will run for the amount of time listed. In answering the questions, use nonpreemptive scheduling, and base all decisions on the information you have at the time the decision must be made															
<table border="0" style="margin-left: 20px;"> <tr> <td style="padding-right: 20px;">Process</td> <td style="padding-right: 20px;">Arrival Time</td> <td>Burst Time</td> </tr> <tr> <td>P₁</td> <td>0.0</td> <td>8</td> </tr> <tr> <td>P₂</td> <td>0.4</td> <td>4</td> </tr> <tr> <td>P₃</td> <td>1.0</td> <td>1</td> </tr> </table>	Process	Arrival Time	Burst Time	P ₁	0.0	8	P ₂	0.4	4	P ₃	1.0	1			
Process	Arrival Time	Burst Time													
P ₁	0.0	8													
P ₂	0.4	4													
P ₃	1.0	1													
Q.5(a) What is the average turnaround time for these processes with the FCFS and SJF (SPN) scheduling algorithms?	[2]	2	4												
Q.5(b) Compute what the average turnaround time will be if the CPU is left idle for the first 1 unit and then SJF scheduling is used.	[3]	2	5												