BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2025)

CLASS: BTECH
BRANCH: CSE/AI

SEMESTER : IV/ADD
SESSION : SP/2025

SUBJECT: CS239 OPERATING SYSTEM

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

---

			CO	BL
Q.1(a)	What are the goals and functions of an operating system?	[2]	CO1	BL2
Q.1(b)	Describe the differences among short term, medium term and long term scheduler?	[3]	CO2	BL3
Q.2(a)	Draw a queueing model for single blocked queue and multiple blocked queue?	[2]	CO4	BL4
Q.2(b)	Draw a process state diagram to explain the life cycle of a process. What are the steps involved during the context switching?	[2+1]	CO2	BL4
Q.3(a)	Under what circumstances is user level threads better than the kernel supported threads?	[2]	CO2	BL4
Q.3(b)	Using constant weighting factor (α=0.5) and initial process of expected time is (E_1=5), what will be the prediction of the next CPU burst time (E_5) if four runs from oldest to most recent values of burst time are :	[3]	CO2	BL5

Process	Burst time
P1	4
P2	8
P3	5
P4	6

Q.4(a)	Give appropriate explanations of the convoy effect of First Come, First Serve (FCFS) scheduling.	[2]	CO2	BL5
Q.4(b)	Consider the set of 5 processes whose arrival time and burst time are given below:	[3]	CO2	BL5

Process	Burst Time	Arrival Time
P1	8	0
P2	2	0
P3	7	0
P4	3	0
P5	5	0

If the CPU Scheduling policy is Round Robin with time quantum =3 unit and context switch time is 1 unit. Calculate Average waiting time, Average turnaround time, Number of context switches and CPU utilization.

Q.5(a)	What advantage is there in having different time-quantum sizes at different levels of a multilevel queueing system?	[2]	CO2	BL4
Q.5(b)	How do you define cache affinity? Also, discuss Single Queue Multiprocessor Scheduling.	[3]	CO5	BL3

::::::27/02/2025::::::E