BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BTECH
BRANCH: CSE/IT

SEMESTER : IV
SESSION : SP/2023

SUBJECT: CS239 OPERATING SYSTEM

TIME: 3 Hours

FULL MARKS: 50

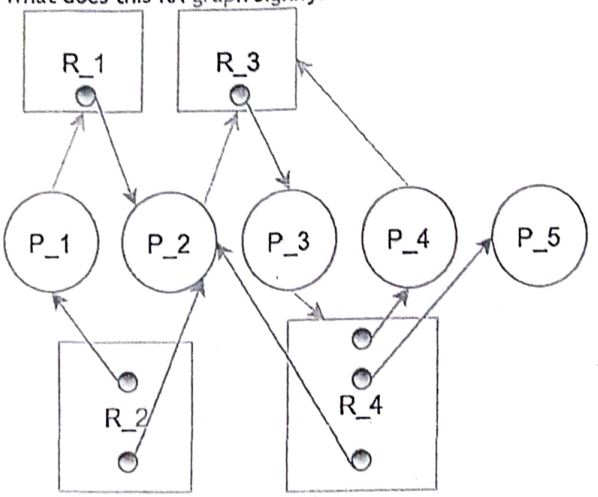
INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a) Explain the need for a dispatcher [2]
Q.1(b) Explain a batch processing and a time sharing system [3]
Q.1(c) Describe the state diagram of a process [5]

Q.2(a) Explain multilevel feedback queue scheduling. [2]
Q.2(b) Describe starvation and aging. [3]
Q.2(c) Compute the average turnaround time in Preemptive SJF, Preemptive Priority (Low Number -> High Priority), and Round robin (T.Q - 2) scheduling. If there is a collision choose FCFS. [5]

Process	Burst Time	Arrival Time	Priority
P_0	10	1	3
P_1	4	2	1
P_2	2	3	3
P_3	1	4	4
P_4	5	5	2
P_5	3	6	4
P_6	1	7	1

Q.3(a) Explain the rules to satisfy any solution to the critical section problem [2]
Q.3(b) What does this RA graph signify? [3]



PTO

Q.3(C) [5]

	Alloc			Max		
	X	Y	Z	X	Y	Z
P0	1	1	2	4	3	3
P1	2	1	2	3	2	2
P2	4	0	1	9	0	2
P3	0	2	0	7	5	3
P4	1	1	2	1	1	2

Available X -> 2, Y -> 1, Z-> 0
Compute the safe sequence.

Q.4(a) Is the worst fit algorithm ever helpful in contiguous memory allocation? [2]

Q.4(b) Explain thrashing and how it can be avoided [3]

Q.4(C) For 3 available frames, the following is the reference string: [5]
7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1
How many page faults will the LRU and Optimal page replacement algorithms produce?

Q.5(a) Explain spooling. [2]

Q.5(b) Provide a comparative study of contiguous, linked, and indexes implementation of files. [3]

Q5(C) A disk drive has 5000 cylinders, numbered 0-4999 The head is now cylinder 143. [5]
Pending queue is - 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130.
What will be the total distance that the disk arm will move in SSTF, C-Look, C-SCAN? Draw it pictorially too.

::::::25/04/2023::::::M