Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, Dec 2023

Course: Operating System **Semester: III**
Program: B.Tech. (CSE, H+ NH) with All Spl. **Time: 03 hrs.**
Course Code: CSEG2007 **Max. Marks: 100**

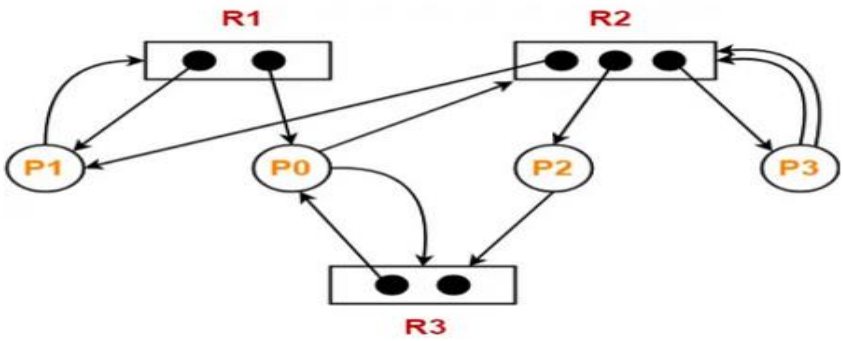
SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q. 1	Explain the concept of the time-sharing operating system.	**4M**	**CO1**
Q. 2	Compare proprietary and Open source Operating system with suitable example.	**4M**	**CO1**
Q. 3	Illustrate how you can prevent from deadlock.	**4M**	**CO3**
Q. 4	Explain the advantage and disadvantages of paging in Operating System.	**4M**	**CO4**
Q. 5	Describe the use of different attributes of a file.	**4M**	**CO5**

SECTION B
(4Qx10M= 40 Marks)

Q.6	Exemplify the requirement of different operating system services.	**10M**	**CO1**
Q.7	Describe what semaphore is, and how semaphore solves the problem of Reader Writer problem.	**10M**	**CO2**
Q.8	Compare multithreading models with suitable example	**10M**	**CO2**
Q.9	Consider a disk queue with requests for I/O to blocks on cylinders 98, 183, 41, 122, 14, 124, 65, 67. The head is initially at cylinder 53 and the cylinders are numbered from 0 to 199. The total head movement (in number of cylinders) incurred while servicing these requests are while using: 1. FCFS 2. LOOK 3. C-LOOK (OR) Compare single-level and tree-structured directories with suitable example.	**10M**	**CO5**

SECTION-C
(2Qx20M=40 Marks)

Q.10	i. Consider the set of 4 processes whose arrival time and burst time has given below. If the scheduling policy is Longest Job First (LJF) preemptive, calculate the average waiting time and turnaround time. Process ID | Arrival time | Burst time P1 | 1 | 2 P2 | 2 | 4 P3 | 3 | 6 P4 | 4 | 8 ii Explain with an example how internal and external fragmentation is caused. How dynamic partitioning helps to avoid external fragmentation? (OR) i. Consider the following information and apply the following page replacement policies: First-Come-First-Served, Optimal Page Replacement and Least Recently Used. Find number of page faults and discuss the utility of these algorithms. Page Size : 150 No. of Frames : 4 Byte Sequence : 662, 556, 696, 463, 362, 829, 136, 622, 155, 172, 537, 273, 398, 547, 47, 111, 123, 507, 264, 319. ii. Explain the following terms briefly with suitable example: a. Demand Paging b. Page Fault c. Thrashing d. Compaction	**10M** **10M** **10M** **10M**	**CO4**
Q. 11	i. Explain Resource allocation graph and its components. In below given RAG, find if the system is in deadlock otherwise find a safe sequence.  	**10M** **10M**	**CO3**

ii. Find whether deadlock can be avoided or not? If yes, then what can be the safe state?

Process	Tape Drives	Plotters	Scanners	CD-Roms
A	3	0	1	1
B	0	1	0	0
C	1	1	1	0
D	1	1	0	1
E	0	0	0	0

Resource Assigned

AVAILABLE: 6 3 4 2
ASSIGNED: 5 3 2 2
REMAINING: 1 0 2 0

Process	Tape Drives	Plotters	Scanners	CD-Roms
A	1	1	0	0
B	0	1	1	2
C	3	1	0	0
D	0	0	1	0
E	2	1	1	0

Resource Needed