Code No: 862AB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MCA I Semester Examinations, May - 2022
OPERATING SYSTEMS

Time: 3 Hours   **Max.Marks:75**

Answer any five questions
All questions carry equal marks
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1.a)   Examine the goals and functions of an operating system.
  b)   Mention the advantages and disadvantages of time-shared operating systems.   [8+7]

2.a)   Differentiate between Parallel systems and Distributed systems.
  b)   What is meant by a system call? Discuss how an operating system makes use of system
        calls for implementing various services.   [7+8]

3.a)   What is the need of the process task control block in process management?
  b)   How is fork() system call differs from an exec() system call? Explain with illustrative
        examples.   [5+10]

4.a)   State the need for inter process communication.
  b)   Following is the snapshot of a CPU

Process	CPU Burst	Arrival Time	Priority
P1	12	0	1
P2	09	1	3
P3	18	2	5
P4	05	3	2
P5	20	4	4

Draw the Gantt chart and calculate the turnaround time and waiting time of the jobs for
FCFS (First Come First Served), SJF (Shortest Job First), SRTF (Shortest Remaining
Time First) and RR (Round Robin with time quantum 5) and priority scheduling
algorithms.   [5+10]

5.a)   Give an example of classical problem of concurrent access to shared resources by multiple
        threads and show how it leads to deadlock?
  b)   Consider the following snapshot of a system: [6+9]

Processes	Allocation A B C D	Max A B C D	Available A B C D
P0	0 0 1 2	0 0 1 2	2 1 0 0
P1	2 0 0 0	2 7 5 0	
P2	0 0 3 4	6 6 5 6	
P3	2 3 4 5	4 3 5 6	
P4	0 3 3 2	0 6 5 2	

Answer the following questions using the banker's algorithm:
i) What is the content of the matrix Need?
ii) Is the system in a safe state? Why?
iii) Is the system currently deadlocked? Why or why not?

6. What is a semaphore? Explain how semaphores are used to implement synchronization between processes with an illustrative example. [15]

7. What is paging and segmentation? Explain paging scheme with relevant diagrams in detail. [15]

8. Explain different File Access Methods and different File Sharing Modes in file system. [15]

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