R17

Code No: 843AC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
MCA I Semester Examinations, October/ November - 2020
OPERATING SYSTEMS

Time: 2 Hours   Max.Marks:75

Answer any five questions
All questions carry equal marks

1.a) What is an operating system? Explain the objectives and functions of an operating system.

   b) Differentiate between parallel system and distributed system.   [7+8]

2. List and explain various disk utilities, process utilities and filters in Linux with clear syntax, options and example.   [15]

3. 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.   [15]

4.a) Discuss briefly about Resource-allocation graph.

   b) Consider the following snapshot of a system:

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

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?
iii) If a request from process P1 arrives for (0, 4, 2, 0), can the request be granted immediately?   [7+8]

5. What is producer-consumer problem? Explain how semaphores are used to implement producer-consumer problem and address the issues raise due to lack of synchronization. [15]

6. List and explain various APIs available to implement inter process communication using message queues. [15]

7. How many page faults occur for the following reference string with three and four page frames using FIFO, LRU and OPTIMAL page replacements algorithms? Assume that initially frames are empty. 3,2,4,3,4,2,2,3,4,5,6,7,7,6,5,4,5,6,7,2,1 [15]

8.a) Explain briefly about directory management and directory implementation.
  b) Explain about lseek, create and write. [7+8]

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