CBCS SCHEME

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15CS64

Sixth Semester B.E. Degree Examination, Aug./Sept. 2020
Operating Systems

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Define operating systems. What are multiprocessor systems? Explain their three main advantages. **(05 Marks)**

b. Compare multi-programming and time sharing systems. **(05 Marks)**

c. Point out and explain the various operating system services. **(06 Marks)**

OR

2 a. What are microkernals? Point out their advantages. **(05 Marks)**

b. What are the two models of inter process communications? What are the strengths and weakness of the two approaches? **(05 Marks)**

c. Compare and contrast, short term, medium term and long – term scheduling. **(06 Marks)**

Module-2

3 a. Point out and explain the various benefits of multi threaded programming. **(04 Marks)**

b. Consider the five processes arrive at time 0, in the order given, with the length of the CPU burst given in milliseconds.

Process	Burst time
P_1	10
P_2	29
P_3	3
P_4	7
P_5	12

Consider the FCFS, SJF and RR (quantum = 10ms) scheduling, draw the Gantt chart for each of the scheduling. Determine average waiting time and turnaround time for all the 3 scheduling algorithm. Which algorithm would give the minimum average waiting time? **(12 Marks)**

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OR

4 a. What is the critical section problem point out and explain its three requirements. **(05 Marks)**

b. What are semaphores, explain how mutual exclusion is implemented with semaphores. **(05 Marks)**

c. What is Dimming philosopher problem explain its monitor solution. **(06 Marks)**

Module-3

5 a. What are deadlocks? Point out and explain its necessary conditions. **(04 Marks)**

b. Explain the various methods of recovery from deadlock. **(05 Marks)**

c. Consider a system with five processes P_0 through P_4 and three resources types A, B and C. Resource type A has 10 instances, resource type B has 5 instances and resource type C has 7 instances suppose that, at time T_0, the following snapshot of the system.

	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P_0	0	1	0	7	5	3	3	3	2
P_1	2	0	0	3	2	2			
P_2	3	0	2	9	0	2			
P_3	2	1	1	2	2	2			
P_4	0	0	2	4	3	3			

Draw the need matrix.

The sequence $< P_1, P_3, P_4, P_2, P_0 >$ is safe state or not. **(07 Marks)**

OR

6 a. Define paging. Explain paging hardware with a neat block diagram. **(08 Marks)**

b. What is segmentation? Explain basic method of segmentation with an example. **(08 Marks)**

Module-4

7 a. What is demand paging? Explain the steps in handling a page fault with a neat diagram. **(08 Marks)**

b. Consider the following sequence

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

How many page faults occurs with three page frames :

i) FIFO

ii) Optimal page replacement

iii) LRU page replacement algorithm. **(08 Marks)**

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OR

8 a. What is a file? What are its attributes, explain file operations. **(06 Marks)**

b. Explain what are the different types of files. **(05 Marks)**

c. Explain file system mounting. **(05 Marks)**

Module-5

9 a. Explain various disk scheduling algorithm with an example. **(10 Marks)**

b. Explain access matrix protection system of O.S. **(06 Marks)**

OR

10 a. Explain the various. Components of the Linux system. **(08 Marks)**

b. Explain the process management in Linux. **(08 Marks)**

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