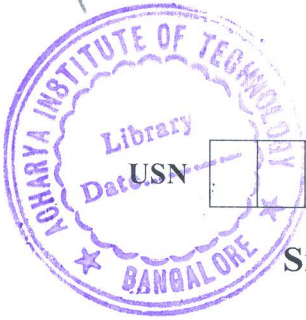


# CBCS SCHEME

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.

### 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 microkernels? 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 <sub>1</sub>	10
P <sub>2</sub>	29
P <sub>3</sub>	3
P <sub>4</sub>	7
P <sub>5</sub>	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)

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  $\langle P_1, P_3, P_4, P_2, P_0 \rangle$  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)

**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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