INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech IV Semester End Examinations (Supplementary) - July, 2018

Regulation: IARE – R16

OPERATING SYSTEMS

Time: 3 Hours   **(Common to CSE | IT)**   Max Marks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) What is a system call? Explain how it is been implemented by passing the parameters. **[7M]**

   (b) What are the differences between kernel mode and user mode? **[7M]**

2. (a) Explain the differences between multiprogramming, multi-tasking and time-sharing systems? **[7M]**

   (b) Explain the system architectures of single, multi processors and clustered systems. **[7M]**

UNIT – II

3. (a) What is a thread? What is a process? Describe how to create each of these in detail. **[7M]**

   (b) What is the producer consumer problem? Give an example of its occurrence in operating systems. **[7M]**

4. (a) Can any of the two scheduling schemes First Come First Serve and Shortest Job First result in starvation? If so, how might you fix this. **[7M]**

   (b) Assume you have the following jobs to execute with one processor, with the jobs arriving in the order listed as shown in Table 1. **[7M]**

Table 1

Job	Burst time (sec)	Priority
P1	8	4
P2	6	1
P3	9	2
P4	1	2
P5	3	3

Calculate average waiting time and turnaround time for the following:

i. First Come First Served method

ii. Shortest Job First method

UNIT – III

5. (a) Differentiate between internal and external fragmentation and which one occurs in paging scheme.
    [7M]

    (b) What is FIFO page replacement algorithm? Enumerate the FIFO with the given reference string as w = dcbadcedcbae with 3 and 4 frames. **[7M]**

6. (a) What is thrashing? How it is been detected? How might one recover from it once detected?
    [7M]

    (b) Consider a logical address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames. **[7M]**
    i. How many bits are there in the logical address?
    ii. How many bits are there in the physical address?

UNIT – IV

7. (a) Describe the attributes of the file and its various operations involved in it. **[7M]**

    (b) Calculate the total time taken by the FCFS, SCAN and LOOK disk scheduling algorithms on a queue 23, 89, 132, 42, 187 in which there are 200 cylinders numbered from 0 - 199 and the disk head starts at number 100. **[7M]**

8. (a) Compare and contrast the methods of direct access and sequential access in file systems. **[7M]**

    (b) Base-limit MMUs can support swapping. What is swapping? Can swapping permit an application requiring 16MB memory to run on a machine with 8MB of RAM? How does the Linux support the swap? **[7M]**

UNIT – V

9. (a) Explain briefly resource allocation graph with examples? **[7M]**

    (b) Why do you need to provide protection to the system? Explain how access matrix can be used for the purpose? **[7M]**

10. (a) What is deadlock? What is starvation? How do they differ from each other? What are the four conditions required for deadlock to occur? **[7M]**

    (b) Assume that there are three resources, A, B, and C. There are 4 processes P0 to P3. At T0 we have the following snapshot of the system as shown in Table 2. Is the system in a safe state? Why or why not? **[7M]**

Table 2

	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	1	0	1	2	1	1	2	1	1
P1	2	1	2	5	4	4			
P2	3	0	0	3	1	1			
P3	1	0	1	1	1	1			