Hall Ticket No ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: ACS007

INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
B.Tech IV Semester End Examinations (Regular) - May, 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) State the main advantage of the layered approach to traditional Unix structure? What are the disadvantages of using the layered approach? **[7M]**

   (b) Why an operating system be more careful when accessing input to a system call when the data is in memory? **[7M]**

2. (a) Define an operating system? State and explain the basic functions or services of an operating system? **[7M]**

   (b) Distinguish between the client-server and peer-to-peer models of distributed systems? **[7M]**

UNIT – II

3. (a) Name and describe different scheduling algorithms. What are the advantages and disadvantages of each? **[7M]**

   (b) What are three requirements of any solution to the critical sections problem? Why are they needed? **[7M]**

4. (a) A semaphore is a blocking synchronization primitive. Describe how they work with the aid of pseudo-code. You can assume the existence of a thread_block() and a thread_wakeup() function. **[7M]**

   (b) Define process. Explain the process state transition diagram with examples. **[7M]**

UNIT – III

5. (a) Compare the number of page faults for LRU and Optimal page replacement algorithm for a given string 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. Which algorithm shows least page faults? **[7M]**

   (b) What are the draw backs of the FIFO page replacement algorithm. **[7M]**

6. (a) Distinguish between page table and inverted page table. With a neat diagram. **[7M]**

   (b) Explain segmentation and its architecture. With a neat sketch. **[7M]**

UNIT – IV

7. (a) What is file sharing and how it would be done among multiple users? What are the failure modes in context to remote file system? **[7M]**

   (b) Discuss operating-system services provided for mass storage RAID system. **[7M]**

8. (a) In how many ways the disks are attached? Explain it briefly with an example. **[7M]**

   (b) What is the maximum file size supported by a file system with 16 direct blocks, single, double, and triple indirection? The block size is 512 bytes. Disk block numbers can be stored in 4 bytes. **[7M]**

UNIT – V

9. (a) Describe four general strategies for dealing with deadlocks. **[7M]**

   (b) Assume that there are 5 processes, P0 through P4, and 4 types of resources. At T0 we have the following system state: **[7M]**

Table 1

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

Use the safety algorithm to test whether the system is in a safe state or not. If the system is in a safe state, can the P1 requests (2,1,1,0) be granted, why or why not?

10. (a) Assuming the operating system detects the system is deadlocked, what can the operating system do to recover from deadlock? Describe the general strategy behind deadlock prevention, and give an example of a practical deadlock prevention method. **[7M]**

   (b) What is the difference between protection and security? Discuss about language based protection. **[7M]**

$- \circ \circ \bigcirc \circ \circ -$