

Code No: 115EH

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year I Semester Examinations, November/December - 2016****OPERATING SYSTEMS****(Common to CSE, IT)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART - A****(25 Marks)**

- 1.a) Distinguish between symmetric and asymmetric multi processor systems. [2]
- b) Define the essential properties of Interactive operating systems and Network operating systems. [3]
- c) What is a dispatcher process? Explain its role. [2]
- d) Describe the differences between preemptive scheduler and non-preemptive scheduler. [3]
- e) What is the need of dynamic loading and dynamic linking? [2]
- f) Explain the differences between internal fragmentation and external fragmentation. [3]
- g) Define mounting. What is the need for mounting in a file system? [2]
- h) What are the typical operations that can be performed on directory? [3]
- i) What is deadlock? What is starvation? How do they differ from each other? [2]
- j) What are the various methods for protection and access control? [3]

**PART - B****(50 Marks)**

- 2.a) Explain briefly about virtual machines and micro Kernels.
- b) Define operating system goals from user's view and system's view. [5+5]

**OR**

3. What are the major activities of an operating system with regard to file management? Explain them briefly with their supporting system calls. [10]

4. Following is the snapshot of a CPU

Process	CPU Burst	Arrival Time
P1	75	0
P2	40	10
P3	25	10
P4	20	80
P5	45	85

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), SRTE (Shortest Remaining Time First) and RR (Round Robin with time quantum 15) scheduling algorithms. [10]

**OR**

5. What is a monitor? Explain how dining philosopher's problem is solved using monitors with example pseudo code. [10]

6. Explain the common techniques for structuring the page table. [10]

**OR**

7.a) Consider a swapping system in which memory consists of the following hole sizes in memory order: 10 KB, 4 KB, 20 KB, 18 KB, 7 KB, 9 KB, 12 KB, and 15 KB. Which hole is taken for successive segment requests of: (i) 12 KB (ii) 10 KB (iii) 9 KB for first fit, best fit, worst fit, and next fit approaches.

b) Explain briefly about LFU Page replacement algorithm. [5+5]

8. Explain the following with relevant diagrams:

a) Two level directory structure.

b) Acyclic-graph directory structure. [5+5]

**OR**

9.a) Explain any two methods used to protect user files with examples.

b) Discuss the log structured file system implementation. [5+5]

10. 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	2 1 0 0
P1	2 0 0 0	2 7 5 0	
P2	0 0 3 4	6 6 5 6	
P3	2 3 4 5	4 3 5 6	
P4	0 3 3 2	0 6 5 2	

Answer the following questions using the banker's algorithm:

a) What is the content of the matrix Need?

b) Is the system in a safe state? Why?

c) Is the system currently deadlocked? Why or why not?

d) Which process, if any, or may become deadlocked if this whole request is granted immediately? [2+3+2+3]

**OR**

11. In the capability-based system, describe the techniques, which can be used to protect the capabilities from unauthorized modification. [10]

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