

B3.4-R3: OPERATING SYSTEMS

NOTE:

1. Answer question 1 and any FOUR from questions 2 to 7.
2. Parts of the same question should be answered together and in the same sequence.

Time: 3 Hours

Total Marks: 100

1.

- a) What is the difference between Process & Thread?
- b) What is striping? What are its advantages & disadvantages?
- c) What is a virtual machine? Explain.
- d) What do you understand by pipes in Unix? What is the difference between pipes & queues?
- e) What do you understand by a Distributed File System?
- f) Write short note on a typical memory hierarchy.
- g) Explain the process of user authentication.

(7x4)

2.

- a) What is the difference between internal and external fragmentation in main memory? How can the problem of internal and external fragmentation be overcome?
- b) What is thrashing. A computer has 16 pages of virtual address space but only 4 page frames. Initially the memory is empty. A program references the virtual pages in the order: 0, 7, 2, 7, 5, 8, 9, 2, 4
 - i) which references cause a page fault with LRU
 - ii) which references cause a page fault with FIFO

(8+10)

3.

- a) Discuss linked and indexed allocation methods for free space on hard disk. List their advantages and disadvantages.
- b) Disk requests came in to the disk driver for cylinders 10, 22, 25, 4, 38, 8, 3, 71 in that order. A seek takes 5 MSec. per cylinder moved. How much seek time is needed for
 - i) FCFS algorithm
 - ii) Shortest-seek-time-first algorithm
 - iii) Elevator algorithmAssume that the arm is initially at cylinder 15.

(9+9)

4.

- a) What is the difference between traps and interrupts? Give an example of each.
- b) Differentiate between short term, medium term and long term scheduling. What is the role of dispatcher in scheduling?
- c) What do you understand by the term Direct Memory Access? How it works? What is Cycle Stealing in DMA? What are its advantages & disadvantages?

(4+5+9)

- 5.
- Assuming three states of a process (Running, Ready, Blocked), draw and explain the state transition diagram.
 - What is a critical section? What are the four conditions that a solution for critical section must satisfy?
 - What is a semaphore? What are the two operations that can be done on a semaphore?
- (6+8+4)**

- 6.
- How can authentication be done by Symmetric keys. Why symmetric keys are used for providing authentication in wireless mobile communication.
 - When is a set of processes said to be deadlocked? What are the four conditions that must hold for deadlock to occur?
 - With 3 resources and 3 processes, draw a resource allocation graph showing a deadlock.
- (9+6+3)**

- 7.
- Given the following data about the process load on a system.

Process	Running time	Priority
A	10	3
B	6	5
C	2	2
D	4	1
E	8	4

- Draw the Gantt Charts and compute average turn around timings of each process using following algorithms
- Round Robin Scheduling
 - Non preemptive Priority Scheduling
- With the help of a diagram, explain the file system of Unix operating system.
- (12+6)**