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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Fourth Semester, B.E. - Information Science and Engineering

Semester End Examination; June/July - 2015

Operating System

Time: 3 hrs

Max. Marks: 100

Note: i) Answer **FIVE** full questions, selecting **ONE** full question from each **Unit**.

ii) Assume suitable missing data if any.

UNIT - I

1. a. Define operating system. Explain how computer system operation takes place with Interrupts. 10
- b. Explain the dual mode operations of operating system with neat sketch. 10
2. a. Write the importance of operating system services and list the services that are helpful to the user. 10
- b. What is multithreading? List and explain its models. 10

UNIT - II

3. a. Explain the scheduling criteria for CPU scheduling. 6
- b. Explain how CPU scheduling takes place for multiple processors. 8
- c. For the following example calculate turnaround time and average waiting time for the following algorithm
- i) Non-preemptive (SJF) ii) FCFS

Process	Arrival Time	Burst Time
P1	0.0	7
P2	2.0	4
P3	4.0	1
P4	5.0	4

4. a. What is Semaphore? Explain Semaphore as a general synchronization tool and write its problems. 10
- b. What is dining Philosophers problem? Give the monitor solution for dining philosopher problem. 10

UNIT - III

5. a. What is deadlock? And Explain deadlock avoidance algorithms (Single instance and multiple instance of a resource type). 15
- b. Explain briefly methods for deadlock recovery. 5

- 6. a. Differentiate between:
 - i) Physical address/ logical address 8
 - ii) External Fragmentation and Internal Fragmentation
- b. With neat sketch explain paging hardware with TLB. 12

UNIT - IV

- 7 a. Using page replacement algorithms FIFO, Optimal of LRU for the following set of data. Find number of page faults (Single Digit) 1 2 3 2 1 5 2 1 6 2 5 6 3 1 3 6 1 2 4 3 12
- b. Explain how thrashing occurs. How do you resolve it? 8
- 8.a. Discuss different types of directory structures. 12
- b. Explain different allocation methods. 8

UNIT - V

- 9 a. Explain the operation of moving head disk mechanism in Hard disk and its parameters to measure its performance. 12
- b. Apply C-SCAN scheduling algorithm to service the following requests and find its average seek length. 55, 58, 39. 18, 90, 160, 150, 38, 184, starting track at 100. 8
- 10.a. How access matrix implemented used for protection. 10
- b. Discuss the Goals and principles of protection. 10

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