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

(An Autonomous Institution affiliated to VTU, Belgaum)

Second Semester - Master of Computer Applications (MCA)

Make-up Examination; Jan/Feb - 2016

Operating Systems

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each **unit**.*

UNIT - I

1. a. What is Operating System? Discuss the different views of Operating System. 6

   b. What is Multiprocessor System? What are the advantages of it? 6

   c. Explain the Java virtual machine. 8

2 a. Explain the importance and functions of Process Management, Memory Management and Storage Management. 10

   b. What is system programming? Explain the different categories of system programme. 10

UNIT - II

3 a. What is PCB? Explain the contents of PCB. 5

   b. Discuss the different ways of implementing buffer space in interprocess communication. 5

   c. Explain the different CPU scheduling algorithm. 10

4 a. Discuss the different CPU scheduling criteria. 5

   b. What are the benefits of multithreaded programming? 5

   c. Consider the following set of processor, with the length of CPU Burst time given in milliseconds, all the process are assumed to be arrived at time. 10

Process	Burst time	Priority
P_1	10	3
P_2	1	1
P_3	2	3
P_4	1	4
P_5	5	2

   i) Draw the Gantt Chart for FCFS, SJF, Priority (small no. is higher priority) and Round Robin (Quantum = 1)

   ii) Find average waiting time and average turn around time for each above type of scheduling.

Contd…2

UNIT - III

5 a. What is the critical section problem? What are the requirements that should be satisfied for the solution to it? 5

b. What is a monitor? Explain its usage. 5

c. Explain the Bankers algorithm for dead lock avoidance. 10

6 a. What is a semaphore? Explain the operations on it? 5

b. What are the necessary conditions for dead lock to occur. 5

c. Consider the following snapshot of a system :

	Allocation A B C	Max A B C	Available A B C
P_1	0 1 0	7 5 3	3 3 2
P_2	2 0 0	3 2 2	
P_3	3 0 2	9 0 2	
P_4	2 1 1	2 2 2	
P_5	0 0 2	4 3 3	

10

i) What is the content of need matrix?

ii) Is the system is in a safe state?

UNIT - IV

7 a. Explain the different types of binding of Instructions and data to memory? 4

b. What is segmentation? Explain the segmentation hardware. 8

c. What is page fault? Explain the steps in handling page fault. 8

8 a. What is memory fragmentation? Explain different types of memory fragmentations. 8

b. Consider the following reference string.

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1 for the given string how many page fault occurs in FIFO, optional page replacement and LRU page replacement algorithms assuming frame size is 3. 12

UNIT - V

9 a. Explain different logical structure of directory. 10

b. Explain different disk space allocation methods. 10

10 a. Explain the different methods of free - space management in disks. 10

b. Explain the different disk scheduling algorithms. 10

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