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

(An Autonomous Institution affiliated to VTU, Belagavi)

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

Semester End Examination; June - 2017

Operating System

Time: 3 hrs *Max. Marks: 100*

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

UNIT - I

1 a. Explain computer-system organization - in terms of computer system operation and storage structure. 10

b. What are the activities for which the operating system responsible for :
i) Process Management ii) File Management. 10

2 a. List and explain services provided by an operating system. 10

b. Explain the state diagram of a process and PCB. 10

UNIT - II

3 a. For the following example, calculate average waiting time, average turnaround time by FCFS, non-preemptive priority, non-preemptive SJF, Round Robin scheduling. 16

Process	Burst Time	Arrival Time	Priority
P_1	21	0	2
P_2	3	1	1
P_3	6	2	4
P_4	2	3	3

Round Robin – Quantum-5Sec.

b. Discuss processor affinity and load balancing in multiple process scheduling. 4

4 a. What are the three requirements to be met by a solution to the critical section problem? Explain Peterson solution. 10

b. Explain Semaphore. Write and explain signal( ) and wait( ) function. 10

UNIT - III

5 a. What is a deadlock? Explain the four necessary conditions for dead lock. 5

b. Consider the following snap shot of a system, 15

	Allocation	Max	Available
	ABC	ABC	ABC
P0	002	004	102
P1	100	201	
P2	135	137	
P3	632	842	
P4	143	157	

Contd…2

With respect to Banker's algorithm, identify

i) Is the system is a safe state?

ii) If a request from process P_2 arrives for (0 0 2) can the request be granted immediately.

6. a Explain First Fit, Best Fit and Worst Fit. Given five memory partitions - 100 KB, 500 KB, 200 KB, 300 KB, 600 KB, How each algorithm performs for processes 212 KB, 417 KB, 112 KB, and 426 KB. 10

b. Discuss the types of fragmentation. Explain how fragmentation can be handled using paging hardware concept? 10

UNIT - IV

7 a. Discuss the steps involved in handling page fault with diagram. 8

b. Consider the following page reference :

String 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2,0,1,7,0,1

How many page faults would occur for FIFO, LRU, and Optimal? 12

Consider 3 pages per frame.

8 a. Discuss the following in brief : 12

i) File attributes ii) File types iii) Sequential File access.

b. Explain contiguous, linked and indexed methods of allocating disk space. 8

UNIT - V

9 a. Explain the following disk scheduling algorithms in brief with examples :

i) FCFS scheduling ii) SSTF scheduling 12

iii) SCAN scheduling iv) Look scheduling.

b. Discuss the file control block and its importance. 8

10a. Discuss the goals of protection, principles, domain of protection. 10

b. Describe the access matrix model used for protection in a computer system. 10

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