Fifth Semester B.E. Degree Examination, June-July 2009
Operating Systems

Time: 3 hrs.   Max. Marks:100

Note : *1. Answer any FIVE full questions, selecting atleast*
TWO questions from each part.
2. Assume missing data if any.

PART - A

1   a. Explain the role of operating system with user and system viewpoints. (07 Marks)
     b. Give the features of symmetric and asymmetric multiprocessing systems. (04 Marks)
     c. Discuss the operating system functions
        i)   that are helpful to user.
        ii)   that are meant for ensuring the efficient operation of system. (09 Marks)

2   a. Describe the process states with the help of state diagram. (06 Marks)
     b. Discuss various multithreading models with diagram. (06 Marks)
     c. Consider the following set of processes.

Process	Burst time	Arrival time	Priority
P1	10	0	2
P2	5	2	1
P3	2	3	0
P4	20	5	3

Table Q2(c)

Draw Gantt charts and calculate average waiting time, average turnaround time
using following CPU scheduling algorithms.
        i)   Preemptive shortest Job First.
        ii)   Non preemptive priority (0 = HIGH Priority). (08 Marks)

3   a. What are the three requirements to be met by a solution to the critical section
problem? Explain. (06 Marks)
     b. Describe the Bounded – buffer problem and give a solution for the same using
semaphores. Write the structure of producer and consumer processes. (08 Marks)
     c. Describe the following : i) Semaphore   ii) Wait ( ) operation
        iii)   Signal ( ) operation. (06 Marks)

4   a. Consider the following snapshot of a system.

	Allocation			Maximum			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

Table Q4(a)

Answer following questions using Bankers algorithm.
        i)   Is the system in a safe state?
        ii) If a request from P1 arrives for (1, 0, 2), can the request be granted
immediately? (09 Marks)

b. Discuss the various approaches, used for deadlock recovery. (06 Marks)

c. Consider the Resource allocation graphs given in fig.Q4(c) (i) and (ii), check whether deadlock exists in the system, if yes, identify the processes involved in deadlock. (05 Marks)
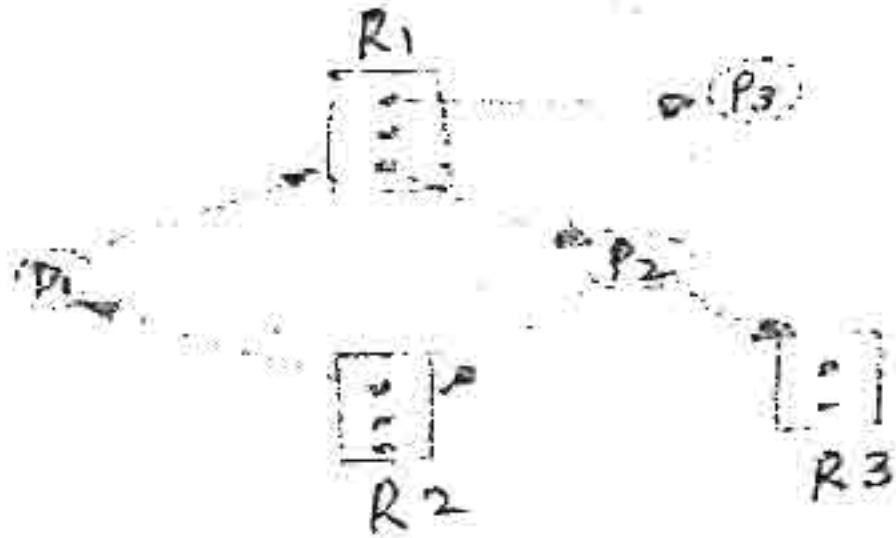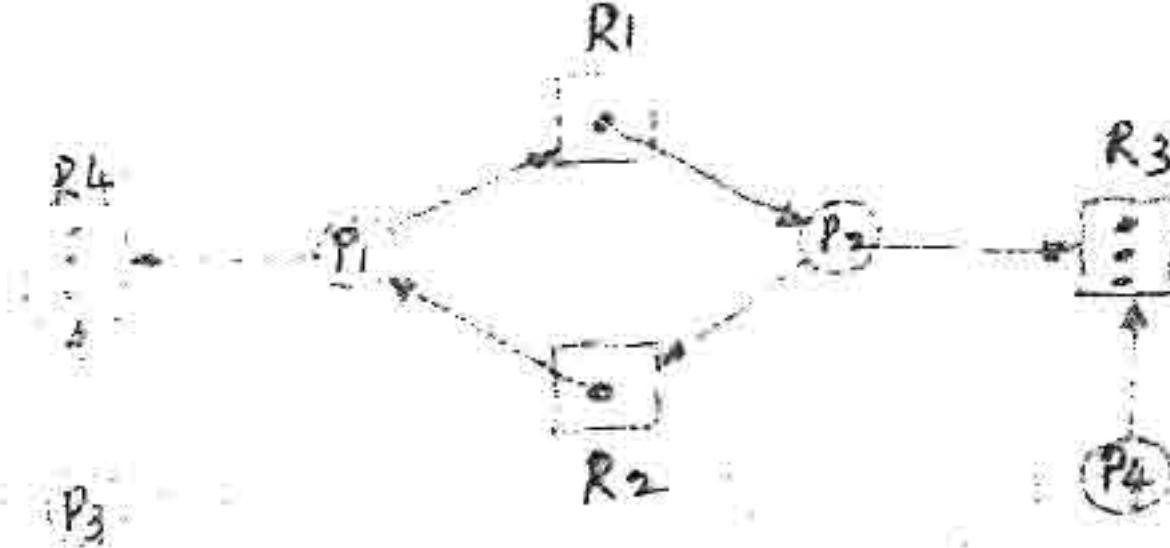

Fig.Q4(c) (i)   Fig. Q4(c) (ii)

PART - B

5 a. Assume we have a paged memory system with associative registers (TLBs) to hold the most active page table entries. If the page table is normally held in memory and memory access time is 1micro second, what would be the effective access time if 85% of all memory references find their entries in the associative registers. Assume that associative registers access time is zero. (04 Marks)

b. Give the differences between : i) Internal and external fragmentation ii) Paging and segmentation. (06 Marks)

c. Discuss the steps involved in handling page fault, with diagram. (06 Marks)

d. 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 page replacement algorithm, assuming three frames? (04 Marks)

6 a. Discuss the following in brief : i) File Attributes   ii) File types iii) Sequential File Access   iv) Tree Structured Directories. (12 Marks)

b. Explain contiguous, linked and indexed methods of allocating disk space. (08 Marks)

7 a. Explain the following disk scheduling algorithms in brief with examples.
i) F C F S Scheduling   ii) S S T F Scheduling   iii) S C A N Scheduling iv) L O O K Scheduling. (12 Marks)

b. Describe the access matrix model used for protection in a computer system. (08 Marks)

8 Write short notes on any FOUR of the following:
a. Components of LINUX system.
b. Process management in LINUX.
c. Inter process communication.
d. Dynamic loading.
e. Process Control Block (PCB). (20 Marks)

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