3rd Semester Regular/Back Examination – 2015-16
OPERATING SYSTEMS
BRANCH(S): MCA
Time: 3 Hours
Max Marks: 70
Q.CODE:T330
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1   Answer the following questions: (2 x 10)
  a) Define "Monitor". What does it consist of?
  b) Is "Multitasking" operating system better than "Batch" operating system? Justify your answer.
  c) Is preemptive CPU scheduling algorithm better than preemptive CPU scheduling algorithm? Justify your answer.
  d) Is it possible to have deadlock involving only two processes? Justify your answer.
  e) Consider two concurrently running processes: P1 with a statement S1 and P2 with a statement S2. Suppose we require that S2 be executed only after S1 has completed. For this synchronization need write a semaphore solution.
  f) What is internal fragmentation problem and how it will be solved?
  g) Is round-robin is better than FCFS in terms of response time? Justify your answer.
  h) What is Process Control Block (PCB)? Describe different information stored in a PCB.
  i) What is thrashing? How it can be overcome?
  j) Explain Belady's Anomaly.

Q2 a) What is process? Explain process state transition with diagram.   (10)
   b) Explain the function of different type of schedulers.

Q3   Draw separate Gantt charts and find out the average waiting time   and   (10)
      average turnaround time of the following processes using   FCFS, SJF,
      preemptive SJF and Round-Robin scheduling algorithms. (Note:
      Consider time quantum is 2 for Round-Robin)

Process	Burst Time	Arrival Time
P1	09	1
P2	11	0
P3	03	2
P4	05	3

Q5 a) Write a synchronization solution for the Readers-Writers problem using   (5)
      semaphore.
   b) Write a synchronization solution for the Bounded Buffer problem using   (5)
      semaphore.

Q4 a) Differentiate between deadlock prevention and deadlock avoidance.   (5)
        Discuss deadlock prevention schemes for different conditions.
    b) Consider the following snapshot of a system: (5)

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

        Answer the following questions using the Banker's algorithm.
        i) Check the safeness of the system.

        ii) If a request from process P1 arrives for (0, 4, 2, 0) can the request be
        granted immediately? Justify your answer.

Q6 a) Define a thread. Differentiate between user level and kernel level   (5)
        threads.
    b) Suppose a disk drive has 5,000 cylinders numbered from 0 – 4999. The   (5)
        drive is currently serving at cylinder 143 and the previous request was at
        cylinder 125. The queue of pending request is in FIFO order as:

        86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130

        Starting from current head position, what is the total distance that the
        disk arm moves to satisfy all the pending requests for each of following
        disk-scheduling algorithm?
                a) FCFS   b) SSTF   c) SCAN   d) C-SCAN   e) LOOK

Q7 a) How the use of TLB is better than the use of PTBR during memory   (5)
        allocation?
    b) Explain Paging memory management system. With a neat block diagram   (5)
        explain how OS brings a page into memory in case of page fault.

Q8   Write Short Notes (Any Two)   (5 x 2)
    a) Context Switching
    b) System call
    c) Virtual Memory
    d) Distributed Operating System