Registration no: | | | | | | | | | | |

Total Number of Pages: 02 **B.Tech**
PCCS4304

6th Semester Regular / Back Examination 2015-16
OPERATING SYSTEM
BRANCH: AEIE, BIOMED, EEE, EIE, ELECTRICAL, FASHION, FAT, IEE, METTA, MM
Time: 3 Hours
Max Marks: 70
Q.CODE: W594

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) Differentiate between threads and processes.
b) Define context switching and spooling.
c) What are the conditions for critical section problem?
d) What is Belady's Anomaly?
e) What must the banker's algorithm know a priori in order to prevent deadlock?
f) Explain race condition with an example.
g) Why must a computer start in kernel mode when power is first turned on?
h) What is Booting? Differentiate between warm booting and cold booting.
i) What is Graceful Degradation? Describe its impact in multiprocessor system?
j) Define and differentiate between sector slipping and sector sparing.

Q2 **a)** What is the difference between preemptive and non-preemptive scheduling? Consider a system implementing multilevel queue scheduling. What strategy can a computer user employ to maximize the amount of CPU time allocated to the user process? **(4)**

b) a. Consider the set of following processes, with their arrival time and length of CPU burst given in mili seconds: **(6)**

Process	Burst Time	Priority	Time of Arrival
P1	9	2	0
P2	7	5	1
P3	2	1	2
P4	8	3	3
P5	4	4	4

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5. Find out the waiting time and turnaround time of each process using SJF and Priority Scheduling. Draw suitable Gantt chart that illustrates the execution of the process.

Q3 **a)** What is Process Synchronization? Describe Critical Section Problem and Peterson's Solution. What are the limitations of Peterson's solution? **(5)**

b) What is multi threading? What are the differences between user thread and kernel thread? Describe various multi threading models. **(5)**

Q4 **a)** What do you mean by Resource Allocation Graph? Consider a system consisting of four resources of the same type that are shared by three processes, each of which needs at most two resources. Show that the system is deadlock free. **(4)**

b) Consider the following snapshot of a system **(6)**

Process	Allocation	Max	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	

Answer the following questions using Banker's Algorithm.

i. What is the content of the matrix Need?
ii. Is the system in a safe state?
iii. What is the Safe Sequence?

Q5 **a)** Given memory partition of 200K, 500K, 300K and 600K (in order). How would each of fist-fit, best-fit and worst fit algorithms place processes of 212K, 417K, 112K and 426K (in order)? Which algorithm makes the most efficient use of memory? **(5)**

b) Explain Paging scheme with inverted page table. What is the purpose of paging the page table? **(5)**

Q6 **a)** What is page fault? Under what circumstances do page fault occur? Describe the action taken by operating system when a page fault occurs. **(4)**

b) How many Page faults occur in LRU and Optimal page replacement algorithm for the following reference string for 4 page frames? Assume that all frames are initially empty. **(6)**

1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 4, 4, 5, 4, 2

Q7 **a)** Suppose a disk drive has 1000 cylinders, numbered 0 to 999. The drive is currently serving a request at cylinder 125 and the previous request was 110. The queue of pending request in FIFO order is **(5)**

85, 45, 470, 915, 180, 490, 510, 220, 750, 160

Starting from current head position, what is the total distance that disk arm moves to satisfy the entire pending request using SCAN and SSTF scheduling algorithm.

b) Explain the structure of Magnetic Disk with suitable diagram **(5)**

Q8 **Write short notes on any four** **(2.5 x 4)**

a) File Access methods
b) Disk Formatting
c) TLB
d) Multilevel Feedback Queue Scheduling
e) Direct Memory Access