Registration No : | | | | | | | | | | |

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

6th Semester Back Examination 2017-18
OPERATING SYSTEM
BRANCH : AEIE, BIOMED, CSE, ECE, EEE, EIE, ELECTRICAL, ETC, FASHION, FAT, IEE, IT, ITE, METTA, MME
Time : 3 Hours
Max Marks : 70
Q.CODE : C538

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.
Answer all parts of a question at a place.

Q1 **Answer the following questions :** **(2 x 10)**

a) What are the main advantages of multiprogramming?
b) What is Throughput, Turnaround time, Waiting time and Response time?
c) 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.
d) Differentiate between a page and a segment
e) Differentiate between internal and external fragmentation.
f) What is a Process control block? Explain all its components.
g) What is the difference between synchronization and mutual exclusion?
h) What is swapping and what is its purpose.
i) Differentiate between Logical and Physical file system.
j) What do you mean by logical address and physical address?

Q2 **a)** Distinguish between multiprogramming and multiprocessing. What is the key motivation for the development of each? **(5)**

b) Differentiate between long-term scheduler and short-term scheduler. What is the purpose of medium-term scheduler? **(5)**

Q3 **a)** Assume, we have the workload as shown below. All 5 processes arrive at time 0, in the order given. The length of the CPU burst time is given in milliseconds **(5)**

Process	**: P1**	**P2**	**P3**	**P4**	**P5**
Burst Time	**: 10**	**29**	**3**	**7**	**12**

Considering the FCFS, SJF and RR (time quantum=10 ms) scheduling algorithms, which algorithm would give the minimum average waiting time.

b) State the Producer-Consumer Problem. Give a solution to the problem using Semaphore. **(5)**

Q4 Consider the following snapshot of a system : **(10)**

	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 the Banker's algorithm

(a) What is the content of the matrix Need?
(b) Is the system in safe state? If so, what is the safe sequence?
(c) If a request from a process P1 arrives for (1, 0, 2) can the request be granted immediately?

Q5 **a)** Give an example of a simple resource deadlock involving three processes and three resources. Draw the appropriate resource allocation graph. **(5)**

b) Explain the principles of segmentation with examples. **(5)**

Q6 **a)** When do page fault occurs? Describe the actions taken by the operating system, when a page fault occurs? **(5)**

b) Given the memory partitions of 600K, 200K, 250K, 500K (in order) how would each of the *first-fit, best-fit and worst-fit* algorithms place processes of 128K, 581K, 411K, 221K(in order)? Which algorithm makes the efficient use of memory? **(5)**

Q7 **a)** Suppose that the head of a moving hard disk with 200 tracks, numbered 0 to 199, is currently serving a request at track 143 and has just finished a request at track 125. The queue of requests is kept in the FIFO order- 86, 147, 91, 177, 94, 150,102, 175, 130. **(5)**

What is the total number of head movements needed to satisfy these requests for the following disk-scheduling algorithms?

(a) FCFS Scheduling
(b) SSTF Scheduling
(c) SCAN Scheduling

b) Describe the need of device management. Explain techniques used for managing and allocating devices. **(5)**

Q8 **Answer any TWO :** **(5 x 2)**

a) Disk Structure
b) RAID Structure
c) Thrashing
d) I-Nodes