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Total number of printed pages – 3

B. Tech  
PCCS 4304

**Sixth Semester Examination – 2013**

**OPERATING SYSTEM**

**BRANCH : IT**

**QUESTION CODE : A 199**

**Full Marks – 70**

**Time : 3 Hours**

*Answer Question No. 1 which is compulsory and any **five** from the rest.*

*The figures in the right-hand margin indicate marks.*

1. Answer the following questions : 2×10
- (a) What is spooling ?
- (b) What are the differences between trap and interrupt ?
- (c) What is multithreading ? What are the advantages of multiprogramming over multiple processes ?
- (d) What is the main advantage of the layered approach to system design ?
- (e) What are the main advantages for an operating system designer of using virtual machine architecture ?
- (f) Differentiate between short term, medium term and long term scheduler.
- (g) What is a dispatcher ?
- (h) What do you mean by compaction in memory management ?
- (i) What is an overlay ?
- (j) Why are page sizes always powers of 2 ?
2. (a) Describe the working principle of multi programming operating system with its memory layout. 5
- (b) What do you mean by Inter Process Communication ? Describe the IPC Systems with suitable example. 5

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3. (a) What do you mean by a system call ? Explain. 5  
 (b) What is PCB ? Describe the contents of a PCB with diagram. 5
4. Consider the following set of processes, with the length of CPU burst time given in milliseconds.

<u>Process</u>	<u>Burst Time</u>	<u>Priority</u>
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order of p1, p2, p3, p4, p5 all at time 0.

- (a) Draw four Gant charts illustrating the execution of these processes using FCFS, SJF, a non preemptive priority (a smaller priority number implies a higher priority), and RR (quantum = 1) scheduling. 5
- (b) What is the waiting time for each process for each of the scheduling algorithm ? 5
5. (a) What is a semaphore ? Explain its use in solving critical section problem. 5  
 (b) Explain in brief the following allocation algorithms in memory management. 5
- (i) Best fit  
 (ii) First Fit  
 (iii) Worst fit.
6. Consider the following snapshot of a system.

	<u>Allocation</u>	<u>Max</u>	<u>Available</u>
	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 Banker's algorithm. 10

- (a) What is the content of the matrix Need ?  
 (b) Is the system in a safe state ?



- (c) If a request from process p1 arrives for (0, 4, 2, 0), can the request be granted immediately ?
7. (a) How many page faults occur in LRU and Optimal replacement for the following reference string, for 4 page frames ? Assume that all frames are initially empty. 5  
1 2 3 4 5 3 4 1 6 7 8 7 8 9 7 8 9 5 4 5 4 2
- (b) Explain the different allocation methods of files in disk space in file system. 5
8. Explain the following terms in brief : 2.5×4
- (a) Distributed Systems
- (b) Monitor
- (c) Thrashing
- (d) Windows Vista.

