

Registration No. :

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Total number of printed pages – 3

B. Tech  
PCCS 4304

Sixth Semester Regular Examination – 2014

OPERATING SYSTEM

BRANCH(S) : EC, ETC

QUESTION CODE : F 268

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 mutual exclusion ?
  - (b) What is thrashing ?
  - (c) What is the disadvantage of user level threads ?
  - (d) Explain, in detail, the structure of PCB.
  - (e) What is the difference between a long-term scheduler and a short-term scheduler ?
  - (f) Does a process incur more execution overhead compared to a thread ? Justify your answer.
  - (g) Why the page size is always a power of 2 ?
  - (h) Differentiate between interrupts and exceptions.
  - (i) How can one detect that a message is lost during Inter Process Communication ?
  - (j) What is critical section and race condition ?
2. (a) Consider the following set of processes with their CPU burst time given in milliseconds :

Process	CPU burst Time	Priority
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 P1, P2, P3, P4, P5 all at time 0.

Draw three Gantt charts illustrating the execution of these processes using FCFS, SJF and RR (time quantum =1) scheduling. 5

(b) When does a process terminate ? Which system call is used to terminate a process ? Under what circumstances a parent process terminates a child process ? 5

3. (a) Given memory partitions of 100 K, 500 K, 200 K, 300 K and 600 K (in order). How would each of the First-fit, Best-fit and Worst-fit algorithms place processes of 212 K, 417 K, 112 K and 426 K (in order) ? Which algorithm makes the most efficient use of memory ? 5

(b) Write about Segmentation with example. Discuss basic difference between paging and segmentation. 5

4. Disk requests come in to the disk drive for tracks in the order of 55, 58, 39, 18, 90, 160, 150, 38, 184. The disk arm is initially at track 100. A seek takes 5 msec per track move. Compare the average seek lengths and seek times achieved with: Shortest Service/Seek Time First (SSTF), SCAN and Circular-SCAN (C-SCAN) strategies. 10

5. (a) What is dynamic loading ? Mention its advantage. How is dynamic linking performed ? Mention any disadvantage that you can think of for both the schemes. 5

(b) What is deadlock ? How can deadlock be prevented by not allowing "Hold and Wait" ? Is it a feasible policy ? 5

6. (a) Consider the following page reference string :

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

How many page faults would occur for the LRU page replacement algorithm, assuming three frames ? 5

- (b) When do page faults occur ? Describe the actions taken by the operating system when a page fault occurs. 5
7. (a) Describe the problems with contiguous allocation method for allocating disk space. How does linked allocation method overcome the disadvantages of contiguous allocation method ? 5
- (b) Provide a programming example of multithreading giving improved performance over a single-threaded solution. 5
8. Write short notes on any **two** : 5×2
- (a) Belady's Anomaly
  - (b) Swapping
  - (c) Semaphores
  - (d) Time-sharing system.

