Registration No. :

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Sixth Semester Regular Examination – 2014

OPERATING SYSTEM

BRANCH : CSE

QUESTION CODE : F 232

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 the purpose of system calls ?

   (b) What is the purpose of the command interpreter ? Why is it usually separate from the kernel ?

   (c) State the practical limitations of implementing non-preemptive SJF algorithm.

   (d) Consider a logical address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames. How many bits are there in the logical address and physical address ?

   (e) What problems could occur if a system allowed a file system to be mounted simultaneously at more than one location ?

   (f) What is Thread ? Mention the benefits of Multithreaded Programming.

   (g) What advantage is there in having different time-quantum sizes on different levels of a multilevel queueing system ?

   (h) Differentiate between interrupts and exceptions.

   (i) Distinguish between logical and physical address space.

   (j) What is critical section and race condition?

P.T.O.

2: (a) Suppose that the following processes arrive for execution at the times indicated. Each process will run the listed amount of time. In answering the questions, use nonpreemptive scheduling and base all decisions on the information you have at the time the decision must be made. 5

Process	Arrival Time	Burst Time
P1	0.0	8
P2	0.4	4
P3	1.0	1

What is the average turn around time for these processes with the SJF scheduling algorithm ?

(b) What are the multithreading models in OS ? 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. Describe Banker's algorithms to detect deadlock in a system. What are the possible recovery strategies once deadlock is detected ? 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) Distinguish between internal and external fragmentation. Provide any two solutions to avoid external fragmentation. 5

6. (a) Suppose that a disk drive is currently serving a request at cylinder 11. The queue of pending requests in FIFO order is 98, 183, 37, 122, 14, 124, 65 and 67. Starting from the current head position, what is the total distance that the disk arm moves to satisfy all the pending requests, for each of the following disk-scheduling algorithm ? 5

   (i) FCFS   (ii) SSTF   (iii) SCAN

   (b) Explain contiguous allocation and linked list allocation for implementing file storage. 5

7. (a) How can synchronization be achieved when two processes communicate by message passing ? 5

   (b) Provide a programming example of multithreading giving improved performance over a single-threaded solution. 5

8. Write short note on any **two** of the following : 5×2

   (a) Belady's Anomaly

   (b) Critical Section Problem

   (c) Semaphores

   (d) Time-sharing system.