Name :	
Roll No. :	An Annual Of Conversion Field Conference

Invigilator's Signature :

CS/M.Tech(CSE)/SEM-1/MCSE-104/2012-13 2012 OPERATING SYSTEM

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.

GROUP - A (Short Answer Type Questions)

1. Answer any *seven* of the following :

 $7 \times 2 = 14$

- i) What are the conditions that must be satisfied by critical section solution ?
- ii) What is the function of the system call semctl()?
- iii) What are the benefits of multithreaded models ?
- iv) What are different kinds of I/O devices ?
- v) What do you mean by ISR ?
- vi) What is the difference between device driver and device controller ?
- vii) What are different types of mutual exclusion implementations when pthreads are used ?

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- viii) Explain the concept of thrashing.
- ix) What do you mean by Belady's anomaly ?
- x) State classical producer and consumer routine.
- xi) Explain the difference between internal and external fragmentation.
- xii) What is TLB reach ?

GROUP – B (Long Answer Type Questions)

Answer any *four* of the following. $4 \times 14 = 56$

- 2. a) Explain : "Every process in UNIX has a parent process."
 - b) Describe paging with combined associative / direct mapping scheme of a virtual address translation system. Use a diagram to explain.
- 3. a) Explain Flynn's categorization of SMP architecture.
 - b) What are different interrupt classes ?
 - c) What is the difference between hard real time system and soft real time system ? 4 + 6 + 4
- 4. a) Explain briefly four layers of I/O software structure.
 - b) Explain microkernel architecture.
 - c) What is the function of the system call fork () ? 4+8+2

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Number of frames available = 3

How many page faults will take place using the following two schemes ?

- i) LRU
- ii) LFU
- b) Explain solution to Dining Philosopher's problem using semaphore.
 8 + 6
- 6. a) Explain the concept of mailbox in message passing.
 - b) Explain POSIX standards in detail. 4 + 10
- A disk system has 200 tracks. The head of the moving disk arm is currently serving a request at track 19.

The reference string for request is : 7, 23, 78, 110, 34, 56, 78, 15, 3 and 1.

Now find out total number of head movements using SSTF algorithm.

- b) Write short notes on the following :
 - i) Embedded system
 - ii) Monitor.
- c) Write down the structure of UNIX file system.

 $4 + (2 \times 4) + 2$

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8. a) Suppose the following processes arrive for execution at the times indicated and the burst times are also as follows :

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

What are the average turnaround time and average waiting time for non-preemptive SJF ?

- b) Explain how FAT is implemented.
- c) Explain the term PPF.
- d) Explain SMP architecture. 5 + 3 + 2 + 4

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