Bachelor Level/ Second Year/ Third Semester/ Science   Full Marks: 60
Computer Science and Information Technology (Csc. 203)   Pass Marks: 24
(Operating System)   Time: 3 hours

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

Section A

Attempt any two questions: **(2x10=20)**

1. How semaphore is used for the process synchronization? Do you think semaphore is the best solutiom for solving critical section problem? Explain using it in Producer-consumer problem.

2. Define first-fit, best-fit and worst-fit strategies of memory placement. Given memory partitions of 10 k, 4 k, 20 k, 18 k, 7 k, 9 k, 12 k, and 15 k (in order). How would each of first-fit best-fit and worst fit algorithms place processes of 12 k, 10 k, and 9 k (in order)? Which algorithms make the best use of memory?

3. What do you mean by disk management? Explain the error handling and formatting operation on the disk.

Section B

Attempt any eight questions: **(8x5=40)**

4. Classify the following applications as batch oriented or interactive and explain the reason

   a) Word processing
   b) Generating monthly bank statements
   c) Computing pi to a million decimal places

5. What is thrashing? Explain the cause and solution for thrashing.

6. Given the references to the following pages by a program 1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6. How many page faults will occur if the program has three page frames available to it and uses FIFO replacement?

7. Discuss in detail the use of translation look aside buffer (TLB) in the process of paging. Support your answer with illustration.

8. What is memory-mapped I/O? Explain with merits and demerits.

9. Write short notes on:
   a) Memory Compaction
   b) Virtual Machines

10. What do you mean by interrupt? Explain the working mechanism of interrupt controller.

11. A disk queue has the following request to read tracks: 87, 170, 4, 57, 173,32, 67 and 183. If disk head is initially at cylinder 90 and there are total 200 tracks then calculate total head movement using C-SCAN and C-LOOK algorithm.

12. What are the scheduling criteria? How does preemptive priority scheduling introduce starvation?