| **MCS-041**

MCA (Revised)

Term-End Examination

June, 2011

MCS-041 : OPERATING SYSTEMS

Time : 3 hours   *Maximum Marks : 100*

Note :   *Question No. 1 is **compulsory**. Attempt **any three** questions from the rest.*

1. (a)   What is a semaphore ? Give solution to   **10**
            sleeping barber problem with the help of
            semaphore.

    (b)   Explain physical and logical clocks. Explain   **10**
            Lamport's scheme of ordering of events.

    (c)   Draw the Gantt Chart for the FCFS and SJF   **10**
            policy, considering the following set of
            processes that arrive at time 0, with the
            length of CPU time given in milliseconds.
            Also calculate the average waiting and
            average turn around time.

Process	Processing time
P1	13
P2	08
P3	19

    (d)   What is segmentation ? Explain with an   **5**
            example.

    (e)   What is an Access - matrix model of   **5**
            security ? Explain with an example.

2. (a) Explain Havender's Algorithm for deadlock   **8**
        prevention. Give a suitable example to
        explain the algorithm.

    (b) Give a short note on mutual exclusion in a   **8**
        distributed system. Explain token based
        mutual exclusion in the context of it.

    (c) What is thrashing ? Give a solution to this   **4**
        problem.

3. (a) Implement FCFS, SCAN, LOOK and   **8**
        C - LOOK scheduling for the following disk
        queues :-
        50, 91, 150, 42, 130, 98, 18, 138, 140.
        Assume that the disk head is initially at
        cylinder 50. Calculate the total heat count.

    (b) Explain Take - Grant model for security in   **8**
        an operating system. Give an example to
        illustrate the model.

    (c) How is overlay different from swapping ?   **4**
        Explain.

4. (a) Explain pipes and filters in UNIX   **5**
        (with examples).

    (b) Give a diagram to explain various states of   **5**
        a process. Explain the PCB or TCB also.

    (c) Explain paging address translation by :-   **10**
        (i)   Direct Mapping.
        (ii) Associative Mapping.
        Give suitable diagrams and examples also.

5. (a) Give short notes on :-   4x4=16

   (i)   Disk Organisation in UNIX.

   (ii) DOS and NOS.

   (iii) Multiprocessor Interconnection.

   (iv) Macintosh OS.

   (b) Differentiate between authorisation and   4
   authentication. How can a user choose a
   good password ?

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