Roll No ................................

# CS - 502
## B.E. V Semester
Examination, December 2012
# OPERATING SYSTEM

*Time : Three Hours*

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*Maximum Marks : 70/100*

*Note:*   Total number of questions is10.  Attempt one question (including all parts) from each unit. Assume missing data, if any, suitably.

### UNIT - I

1. (a)   What is meant by operating systems? Explain various types of operating systems in detail.

   (b)   Compare the following :

   (i) Spooling and Buffering.

   (ii) Hard-Real time systems and Soft-real time systems

### OR

2. (a)   Explain various services provided by an operating system. Explain how each provides convenience to the users. Explain also in which cases it would be impossible for user level programs to provide these services.

   (b)   Explain the following :

   (i) Spooling and Buffering

   (ii) Multitasking and multiprogramming.

### UNIT-II

3. (a)   What are various file allocation methods? Explain Linked allocation method in detail.

PTO

(b) Define following : **www.rgpvonline.in**

(i) Boot block.

(ii) Sector sparing

(iii) Levels of RAID

(iv) Device Driver

OR

4. (a) The queue of pending requests, in FIFO order, is :

86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk scheduling

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

(v) C-SCAN

(b) Explain in detail about various ways of free space management.

## UNIT-III

5. (a) Consider the following set of processes, with the length of the CPU-burst time given in milliseconds :

| Process | Burst Time | Priority |
|---------|-----------|----------|
| $P_1$ | 10 | 3 |
| $P_2$ | 1 | 1 |
| $P_3$ | 2 | 3 |
| $P_4$ | 1 | 4 |
| $P_5$ | 5 | 2 |

The processes are assumed to have arrived in the order $P_1, P_2, P_3, P_4, P_5$, all at time 0.

(i)    Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, a non preemptive priority and RR (quantum = 1) scheduling.

(ii)   What is the turnaround time of each process for each of the scheduling algorithms?

(iii)   What is the waiting time of each process for each of the scheduling algorithms?

(iv)   Which of the scheduling in part a results in the minimal average waiting time?

(b)   What are the conditions necessary to hold for deadlock occur?

(c)   What is a semaphore?

(d)   What is preemptive and non preemptive scheduling?

OR

6. (a)   What is critical section problem and explain two process solutions and multiple process solutions?

(b)   Consider the following snapshot of a system:

| Process | Allocation ABCD | Max ABCD | Available ABCD |
|---------|-----------------|----------|----------------|
| $P_0$ | 0012 | 0012 | 1520 |
| $P_1$ | 1000 | 1750 | |
| $P_2$ | 1354 | 2356 | |
| $P_3$ | 0632 | 0652 | |
| $P_4$ | 0014 | 0656 | |

Answer the following questions using the banker's algorithm:

(i) What is the content of the matrix Need? Is the system in a safe state?

(ii) If a request from process P1 arrives for (0, 4, 2, 0), can the request be granted immediately.

**UNIT-IV**

7. (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 following replacement algorithms for three and four frames? Remember all frames are initially empty, so your first unique pages will all cost one fault each.

(i) LRU replacement

(ii) FIFO replacement

(iii) Optimal replacement

(b) Describe internal and external fragmentation with illustrative examples.

(c) What are the major problems to implement demand paging?

OR

8. (a) Explain the following :

(i) MFT        (ii) Paging  (iii) Segmentation

(iv) TLB hit/miss

(b) Define TLB? With diagram.

(c) Write about Thrashing. Exactly when it occurs with diagram.

## UNIT-V

9. (a) Explain the concept of Parallel Processing.

(b) What do you mean by distributed operating system? Discuss the design issues for a distributed operating system.

OR

10. Write short notes on following :

(i) RMI

(ii) Distributed shared memory

(iii) Parallel Processing