

**BACHELOR OF COMPUTER APPLICATIONS  
(BCA) (Pre-Revised)**

01023 **Term-End Examination**  
**June, 2015**

**CS-63 : INTRODUCTION TO SYSTEM SOFTWARE***Time : 2 hours**Maximum Marks : 60*

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**Note :** *Question number 1 is compulsory. Attempt any three questions from the rest.*

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

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to be arriving in the order P1, P2, P3, P4, P5, all at time 0.

- (i) Draw Gantt Charts, illustrating the execution of these processes using SJF, FCFS and RR (quantum = 1) scheduling.

- (ii) What is the turnaround time of each process for each of the scheduling algorithms given in part (i) above? 10
- (b) Compare the performance of C-SCAN and SCAN scheduling, assuming a uniform distribution of requests. Consider the average response time, the variation in response time and the effective bandwidth. How does the performance depend on the relative sizes of seek time and rotational latency? Explain with an example of each. 6
- (c) Explain the concept of semaphores and their usage. Give an implementation (or algorithm) to avoid busy waiting situation. Use binary semaphores. 8
- (d) Explain the following : 6
- (i) File System Mounting
  - (ii) Kernel I/O Subsystem
  - (iii) RAID and its levels
2. (a) Explain the term demand paging. Give an implementation of demand paging scheme. Explain the steps in handling a page fault. Also, give an example to explain it. 6
- (b) Write a shell script to create a new file and append the contents of another file to it. 4

3. (a) Using an example, explain the banker's algorithm, developed for deadlock avoidance. 6
- (b) Draw and explain the typical X-Window Development Environment. 4
4. (a) Construct a parse tree for the expression  $a + b * c$  based on a grammar for an arithmetic expression. 3
- (b) Categorise editors and write the characteristic features of each. 3
- (c) Explain the concept of address translation by associative memory using a suitable diagram. 4
5. (a) Explain the methods of protection and security provided for hardware resources by operating system. 6
- (b) Explain the use of the following UNIX commands : 4
- (i) echo
  - (ii) chmod
  - (iii) pwd
  - (iv) mail
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