

**BACHELOR OF COMPUTER APPLICATIONS  
(BCA) (Pre-Revised)****Term-End Examination****December, 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) What is Page fault in Paging ? Consider the following page reference string : 10  
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, assuming one, two, three, four, five, six or seven frames ? Remember all frames are initially empty, so your first unique pages will all cost one fault each.
- (i) LRU
  - (ii) FIFO
  - (iii) Optimal Replacement

- (b) Write short notes on the following : 10
- (i) Log Structured File System
  - (ii) Real Time System
  - (iii) Dynamic Loading and Linking
  - (iv) Deadlock Prevention

- (c) Suppose that a disk drive has 5000 cylinders, numbered from 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125.

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 algorithms : 10

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

2. (a) What is mutual exclusion ? Write an algorithm to provide mutual exclusion using binary semaphore. 6
- (b) What are the benefits of multithreaded programming ? 2
- (c) Explain the use of fork and exec system calls. 2
3. (a) What are the various scheduling criteria for CPU scheduling ? Also, differentiate between preemptive and non-preemptive scheduling ? Give an example of each. 4
- (b) Write a shell script that prints a list of every unique word contained in the file in alphabetical order. 4
- (c) Why are "diff" and its variants more suitable for comparing text files than "cmp" command ? 2
4. (a) Explain the different disk allocation methods. Also, write one advantage and one disadvantage of each. 4
- (b) Describe the phases of a 2-phase assembler, with the help of a suitable diagram. Also, explain the steps and procedures used in these phases. 6

5. (a) How can the index blocks be implemented in the indexed allocation scheme? Explain. 5
- (b) Write a note on TSL and SWAP instructions. 3
- (c) Define the term 'Race condition' with an example. 2
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