

Roll No. ....

# BCA-401

**B. C. A. (Fourth Semester)**

**EXAMINATION, 2014**

Paper First

**OPERATING SYSTEM ORGANIZATION AND UNIX**

*Time : Three Hours ]*

*[ Maximum Marks : 70*

**Note :** Attempt any *five* questions. All questions carry equal marks.

1. (a) What is Operating System ? Discuss the various features of operating system.  
(b) What is the purpose of system calls ? List the system calls used in operating system.
2. (a) What is Scheduling ? Differentiate between FIFO and RR scheduling.  
(b) Consider the following set of processes, with the length of the CPU—burst time given in milliseconds :

Process	Burst Time
P1	24
P2	3
P3	3

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- (i) Draw a Gantt chart and compute average waiting time illustrating the execution of these processes using FCFS, SJF (Non-preemptive).
  - (ii) Repeat with round robin scheduling assuming that the CPU time-slice is 4 milliseconds.
3. (a) What are the difference between user level threads and kernel supported threads under what circumstances is one type better than the other ?
- (b) What is Thrashing ? Why does it occur ? Once it occurs, what can the operating system do to eliminate ?
4. (a) List down the *four* conditions for a deadlock . Explain.
- (b) What is critical-section problem ? Give a solution for reader-writers problem using conditional critical regions.
5. (a) List the steps needed to perform page replacement. Explain the different page replacement policies. Also list out the main requirements, which should be satisfied by a page replacement policy.
- (b) What is a protocol with respect to communicating processes ? Describe blocking and non-blocking protocols. Give their respective advantages and disadvantages.

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6. (a) Define and explain *three* classical problems of synchronisation.
- (b) Discuss the various attributes of a file. What are the methods that help in accessing the information stored in a file ? Discuss them.
7. (a) When do page fault occur ? Describe the actions taken by the operating system when a page fault occurs. Explain using suitable diagram.
- (b) What is meant by an allocation method ? Explain major methods of allocating disk space. Write advantages and disadvantages of each method.
8. (a) Explain the following facilities for implementing interacting processes in programming languages and operating system. :
- (i) Fork-Join primitives
- (ii) Unix processes
- (b) What is an I/O buffer ? What is the advantage of buffering ? Is buffering always effective ? Justify your answer with the help of an example.

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