ROLL NO. _____

Code: CT31 **Subject: OPERATING SYSTEM**

ALCCS - NEW SCHEME

Time: 3 Hours **AUGUST 2013** **Max. Marks: 100**

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE:

- **Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.**
- **Parts of a question should be answered at the same place.**

Q.1 a. Explain concept and working of Virtual machine.

b. What is process control block? Explain.

c. What do you mean by boot strap program? Explain briefly.

d. What are the advantages of multiprocessor system? Explain briefly.

e. Explain the concept of demand paging.

f. Explain the layered architecture of an operating system.

g. Differentiate between preemptive and non preemptive scheduling. **(7 × 4)**

Q.2 a. Describe reasons for providing an environment that allows process cooperation. Explain the following terms related to IPC:
Naming, Synchronization and Buffering **(9)**

b. Consider two processes P1 and P2, where p1 = 50, t1 = 25, p2 = 75 and t2 = 30.
(i) Can these two processes be schedules using rate-monotonic scheduling? Illustrate your answer using a Gantt Chart.
(ii) Illustrate the scheduling of these two processes using earliest-deadline-first (EDF) scheduling. **(9)**

Q.3 a. What aspects of a distributed system would you select for a system running on a totally reliable network? **(6)**

b. What are the advantages and disadvantages of buffer cache? **(6)**

c. Why is deadlock detection much more expensive in a distributed environment than in a centralized environment? **(6)**

Q.4 a. Explain different methods for user authentication for security. **(6)**

b. What is system call? Explain various types of system call. **(6)**

c. How does the principle of least privilege aid in the creation of protection systems? **(6)**

Q.5 a. What is a process? Discuss various states of a process? Give a list of events that are responsible for process state transitions. **(6)**

b. Explain Banker's algorithm to handle deadlocks. **(6)**

c. Describe a mechanism by which one segment could belong to the address space of two different processes. **(6)**

Q.6 a. What are the six basic file operations? Explain in detail. **(6)**

b. What is a semaphore? Explain the Critical Section (CS) implementation with semaphores. **(6)**

c. Differentiate between static and dynamic disk scheduling for multimedia. **(6)**

Q.7 a. What is paging? Explain paging hardware. **(6)**

b. Compare following CPU scheduling algorithms using a suitable example.

(i) FCFS
(ii) Priority
(iii) Round Robin

Which one is best to use? **(8)**

c. There are two sets of reasons for high overheads of switching between processes- Intrinsic reasons and OS-related reasons. Briefly describe each. **(4)**