



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

**SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF SCIENCE IN COMPUTER ENGINEERING**

SCE 520: REAL TIME SYSTEMS

DATE: WEDNESDAY 11TH APRIL 2012

TIME: 11.00 A.M. – 1.00 P.M.

INSTRUCTIONS

Answer Question One and any other Two Questions

Question One

- a) Giving examples, define the essential difference between the following systems (6 marks)
- i) Batch systems
 - ii) Real time systems
 - iii) Time sharing systems
- b) What are the main difficulties in writing an operating system for a real time environment. (3 marks)
- c) What is the primary objective of real time systems. (2 marks)
- d) The operating systems designed for text are not optimal for multimedia. Give two reasons for this. (4 marks)
- e) Give five characteristics of real time systems. (5 marks)
- f) Describe three categories of real time systems. (6 marks)
- g) In some real time systems processes are pre-emptable and in others they are not. What does this mean. (4 marks)

Question Two

Describe how the following resources are managed in real time operating systems.

- i) Memory (5 marks)
- ii) File system (5 marks)
- iii) I/O management (5 marks)
- iv) Process management (5 marks)

Question Three

- a) Briefly define real time scheduling (4 marks)
- b) Giving relevant illustration describe how real time multimedia scheduler are implemented. (8 marks)
- c) Explain four Common Misconceptions of the real time systems (8 marks)

Question Four

- a) Several methods exist to aid the design of real-time systems. In typical designs, a task has three states. List and explain each of them (6 marks)
- b) Describe the concept behind the Real-Time communications (8 marks)
- c) Describe Real-time database system, issues. (6 marks)

Question Five

- a) Explain the implementation of
 - i) Rate Monotonic (5 marks)
 - ii) Earliest Deadline first (5 marks)
- b) Explain fault tolerance mechanism in real time systems (5 marks)
- c) What is involved in safety-critical real-time systems (5 marks)