THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

DIPLOMA IN TECHNOLOGY
TELECOMMUNICATION & INFORMATION ENGINEERING
COMPUTER AND NETWORK ENGINEERING

EEE 33106: EMBEDDED SYSTEMS

END OF SEMESTER EXAMINATIONS

SERIES: AUGUST/SEPTEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination

- *Answer booklet*
- *Non Programmable Calculator*

Answer question **ONE (COMPULSORY)** and any other **TWO** questions

This paper consists of **THREE** printed pages

Question 1 (Compulsory)

a) Define the following terms:
   (i) Embedded system
   (ii) Thread
   (iii) Kernel (6 marks)

b) Describe the functions of any **FOUR** components of an embedded system (8 marks)

c) List **FOUR** application areas of Embedded systems (4 marks)

d) Describe **FOUR** characteristics used in the classification of peripheral devices (12 marks)

Question 2

a) State and explain **THREE** classes of embedded systems. (9 marks)

b) Define the following terms:

   i) Real-time systems
   ii) Process
   iii) Hard real time
   iv) Soft real time (8 marks)

c) List **THREE** types of processors that can be used in Embedded systems (3 marks)

Question 3

a) Differentiate between embedded systems and desktop computers (4 marks)

b) Describe any **THREE** types of memory used in embedded systems giving **TWO** examples in each case (9 marks)

c) Define the following terms:

   i) Interrupt vector
   ii) Data throughput (4 marks)

d) List **THREE** real-time resource locking protocols proposed for RTOS. (3 marks)

Question 4

a) Explain the following terms;

   i) Baud rate
   ii) Asynchronous Transmission (4 marks)

b) Describe the bits of any word that is transferred on a UART serial bus. (8 marks)

c) Explain any **FOUR** properties of RTOS (8 marks)

Question 5

a) Explain the following terms:

i) Bus arbitration
ii) Interrupt latency
iii) Acknowledgment (3 marks)

b) (i) Distinguish between preemptive and no preemptive kernels (4 marks)
(ii) Explain **TWO** differences between RTOS and general purpose OS (4 marks)

c) Describe the **THREE** categories of tasks in real time scheduling (6 marks)

d) State any **THREE** types of intelligent processor architectures (3 marks)