TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

EIT 4422: EMBEDDED SYSTEMS

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

DATE: Pick Date Apr 2016

<u>**Instructions to Candidates**</u>
You should have the following for this examination
-*Answer Booklet, examination pass and student ID*
This paper consists of Choose No questions. Attempt Choose instruction.
Do not write on the question paper.

Question ONE

a. When approaching embedded systems architecture design from a systems engineering point of view, several models can be applied to describe the cycle of embedded system design. Briefly describe the four most common models (8 marks)

b. Describe briefly the advantages both technical and commercial of using an RTOS (4 marks)

c. With suitable examples explain the various application areas of embedded systems (8 marks)

d. An architectural systems engineering approach to embedded systems is one of the most powerful tools that can be used to understand an embedded systems design or to resolve challenges faced when designing a new system, what are the most commonly faced challenges in design
((6 marks)

e. Define the following terms as used in Embedded systems (4 marks)

• Microprocessor
• Microcontroller

Question TWO

a. What are Interrupts Handler and why are they important to embedded systems (6 marks)

b. Define an embedded systems and explain its contents (8 marks)

c. With a diagrammatic example describe the Embedded system model (6 marks)

Question THREE

    a. Explain the Characteristics of embedded system   (10 marks)

    b. Explain the classification of an embedded system with suitable examples   (10 marks)

Question FOUR

a. In relation to embeds systems explain the following terms   (10 marks)

- Module
- Component and Connector
- Allocation

b. What is the Embedded Systems Design and Development Lifecycle Model explain this concept with a diagrammatic illustration   (10 marks)

Question FIVE

a. In details describe the architectural design of an embedded system   (10 marks)

b. Most Embedded systems need to engage in multitasking and to do this they sometimes make use of a Real Time Operating System (RTOS). In the context of an RTOS, explain the following terms using diagrams if appropriate ((10 marks)

- Task
- Priority
- Clock tick
- Pipelining scheduling