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: EMBEDED SYSTEM

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: SEPTEMBER 2018

TIME: 2 HOURS

DATE: Sep 2018

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of Choose No questions. AttemptChoose instruction.

Do not write on the question paper.

Question ONE

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

b. Describe briefly the advantages both technical and commercial of using an RTOS (6 marks)

c. Define a processor and explain the classification of IC Chips in embedded systems (6 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. Distinguish between Flow Control Unit and Execution Unit (6 marks)

Question TWO

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

b. Explain the functionality of the following architectural structure in Embedded systems (10 marks)

   I. Module
   II. Layers
   III. Kernel
   IV. Channel Architecture
   V. Virtual Machine

Question THREE

a. Explain the functionality of the following in a system (8 marks)
   I. Reset circuit:
   II. Interrupt controller:
   III. Multiplexer:
   IV. Assembler:

b. What is a device driver in embedded systems (2 marks)

c. Explain the three main functions of device drivers (6 marks)

d. Differentiate between a Demultiplexer and A multiplexer (4 marks)

Question FOUR

a. In details describe the architectural design of an embedded system (8 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 (8 marks)
   1. Task
   2. Priority
   3. Clock tick
   4. Pipelining scheduling

c. Explain the functions of an assembler in embedded systems (2 marks)

Question FIVE

a. Explain how the following software modules and tools are used for an embedded system design (8 marks)
   1. Cross Assembler
   2. Stethoscope
   3. Trace Scope
   4. Locator

b. In relation to embedded systems explain the following terms (8 marks)
   1. Allocation
   2. Work Assignment
   3. Implementation
   4. Deployment

c. Differentiate the following Microprocessor and Microcontroller (6 marks)