



TECHNICAL UNIVERISTRY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING

DIPLOMA IN ELECTRICAL POWER ENGINEERING
(DEPE 6 -EV)

EEE 2303: MICROCONTROLLER SYSTEMS

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2014

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Answer any **THREE** questions

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

Question One

- a) Explain the functions of the following:
(i) TRISB
(ii) STACK
(iii) W register (6 marks)
- b) Draw the architecture of a microcontroller and explain the functions of each block. (10 marks)
- c) Distinguish between the operations PUSH and POP (4 marks)

Question Two

- a) Explain any FOUR factors that distinguish microcontrollers from microprocessors. (8 marks)
- b) Explain the following operations:
(i) MOVLW 05H
(ii) XORWF PORT B
(iii) RRF PORTA, 1 (6 marks)
- c) Explain the functions of the following registers:
(i) OPTION
(ii) TMRO
(iii) STATUS (6 marks)

Question Three

- a) (I) Explain the functions of the following:
(i) Prescaler
(ii) INTCON register
- (II) Draw a table to show the different configurations that can be made on the prescaler. (8 marks)
- b) Explain any THREE types of microcontroller giving ONE advantage in each case (12 marks)

Question Four

- a) 8 – LEDs are connected to the PIC 16F8A microcontroller to implement a running light.
(i) Draw the circuit
(ii) Write the program (16 marks)
- b) Distinguish between the following instructions:
(i) RETURN
(ii) BTFSC PORTB, 2 (4 marks)

Question Five

- a) Explain the process of ‘burning’ a program into a microcontroller. (8 marks)

- b)** Explain any THREE reasons for interfacing between microcontrollers and external circuitry. **(6 marks)**
- c)** (i) State any ONE actuators and TWO sensors used in Microcontroller based systems. **(6 marks)**
(ii) Explain the process of soldering