**NNAMDI AZIKIWE UNIVERSITY, AWKA**

**Department of Electronic and Computer Engineering**

**First Semester 2016/2017 Examination**

**ECE 421: Assembly Language Programming**

**Date:23/03/2017 Time allowed – 2 hrs**

**Instructions: Answer four questions in all. Two questions from section A and two questions from section B.**

**Section A**

1a) Write a program in an Assembly language for an AT89C52 microcontroller to display the word **FUCELOCH** in a common cathode seven segment. Show the code table and the interfacing diagram. Use 10 MHz crystal oscillator.

1b) Use a setbit programming technique in Assembly language to develop a program for an ON/OFF operation of eight LEDs connected to one port of AT89C52 microcontroller. Show the interfacing diagram and the pseudocode. Use 12 MHz crystal oscillator and a delay of one second.

2a) Write an Assembly language program for an AT89C52 microcontroller to display the information: **When the Saviour comes, men will know** on LCD. Show the interfacing diagram and the pseudocode. Use 10MHz crystal oscillator.

2b) Develop a program in an Assembly language for an AT89C52 microcontroller to scroll the display of **Eguo\_235** in a common anode seven segment. Show the code table and the interfacing diagram. Use 12 MHz crystal oscillator.

3) Design a Microcontroller-based Traffic Light Control System for a five-way traffic junction at Aroma, Awka. Write an Assembly Language program for the operation. Show the interfacing diagram, pseudocode code and the code-table. Use 12MHz crystal oscillation.

**Section B**

1a) In terms of organization of the magnets, differentiate clearly between the brush and the brushless motor

1b) The comparator output satisfies 2 basic rules, mention them

1c) Under what condition(s) does a semiconductor material emit light? (give your answer in terms of particle-particle energy transfer.

2a) If increase or decrease in voltage drop equals the temperature change and sensitivity is 1volt/oC, calculate the final temperature if a current of 3A is passed through an RTD of 100ohms and causes its resistance to increase by 10ohms. Assume that the RTD’s original temperature was 20oC.

2b) Distinguish between a backlit and a reflective LCD

2c) Three basic rules a good sensor must obey are?

3a) How do you achieve pole reversal in brushless motors

3b) In terms of energy conversion and conservation, how is the brushless motor more efficient than the brush motor

3c) The combination of four facts makes LCDs possible, what are they?