EGERTON UNIVERSITY

UNIVERSITY EXAMINATIONS

REGULAR-NJORO- CAMPUS

SECOND SEMESTER, 2017/2018 ACADEMIC YEAR

THIRD YEAR RESIT/SPECIAL EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE AND ENGINEERING

COMP 222: ASSEMBLY LANGUAGE PROGRAMMING

STREAM: BSC. (COMP &ENGINEERING) TIME: 2HRS

EXAMINATION SESSION:OCTOBER YEAR: 2018

INSTRUCTIONS:

(i) This paper contains five questions

(ii) Answer question one and any other two questions

(iii)Do not write on the question paper

Question One Compulsory (30 marks)

a. What is the function of an interrupt vector? **[2 marks]**

b. Differentiate between Low Level and High Level Languages **[3 marks]**

c. Differentiate between the two ways of prioritizing interrupts. **[4 marks]**

d. With an example explain the function of the stack and the stack pointer. **[3 marks]**

e. Discuss the steps involved in the execution of a microprocessor instruction. **[3 marks]**

f. Write an 8085 assembly language program to multiply two 8-bit numbers. **[5 marks]**

g. What is the state of the Flag Register and the Accumulator after the following Arithmetic operation; $FF_{16} + FB_{16}$ **[4 marks]**

h. Write an 8085 assembly language program that adds ten numbers with the first number stored in 8500H. Store the sum in 8500H and a Carry in 8501H. **[6 marks]**

Question Two (20 marks)

a. Discuss the addressing modes in the 8085 microprocessor? [5 marks]

b. Define a computer bus and discuss the various computer buses in the 8085 Microprocessor. [5 marks]

c. Write an 8085 assembly program that subtracts two decimal numbers. [5 marks]

d. Write an 8085 assembly language program that adds two 16 bit numbers with a carry. [5 marks]

Question Three (20 marks)

a. What is an Operand? [2 marks]

b. Write an 8085 assembly language program to arrange numbers in a descending Order. [9 marks]

c. Discuss the following data transfer schemes;

i. Interrupt driven I/O [3 marks]

ii. Direct Memory Access [3 marks]

iii. Programmed I/O [3 marks]

Question Four (20 marks)

a. Explain any one reasons for having a form of interrupt in any microprocessor based system. [2 marks]

b. Discuss the effect of the I/O instructions on the microprocessor speed. [2 marks]

c. Explain the function of the following in a microprocessor during program execution;

i. Flag register [2 marks]

ii. Program counter [2 marks]

iii. Instruction Register [2 marks]

iv. Instruction Decoder [2 marks]

d. As an engineering person you have been given an assignment to design an automated heating and lighting system. With the aid of a block diagram describe how this assignment can be achieved. [8 marks]

Question Five (20 marks)

a. What is an OpCode? **[2 marks]**

b. Write a program that carries an XOR operation on two numbers and store the answer in 8600H. **[4 marks]**

c. With the aid of an 8085 microprocessor architecture block diagram, explain the function of the following parts; **[4 marks]**

i. Instruction Register **[2 marks]**

ii. Timing and control unit **[2 marks]**

iii. Interrupt control **[2 marks]**

iv. Instruction Decoder **[2 marks]**

v. Stack Pointer **[2 marks]**

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