

KABARAK



UNIVERSITY

UNIVERSITY EXAMINATIONS

2010/2011 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

COURSE CODE: COMP 210

COURSE TITLE: ASSEMBLY LANGUAGE PROGRAMMING

STREAM: Y2S1

DAY: TUESDAY

TIME: 2.00 – 4.00 P.M.

DATE: 15/03/2011

INSTRUCTIONS:

- 1. This question paper has four questions**
- 2. QUESTION ONE IS COMPULSORY AND HAS 30 MARKS**
- 3. Answer any other two questions worth 20 marks each.**

PLEASE TURN OVER

QUESTION ONE (30 marks)

- (a) What are the advantages of an assembly language in comparison with high level languages? (2mks)
- (a) What are the flags in 8086? Give examples (3mks)
- (b) Logic and arithmetic calculations are done in which type of registers? (2mks)
- (c) Why digital systems are usually operated on a binary system? (2mks)
- (d) Which registers move onto stack with the PUSH instructions? (3mks)
- (e) Write any three rules of using a MOV instruction with examples in each (6mks)
- (f) Write an assembly language program to find the 1's complement. (2mks)
- (g) Write an assembly language program that subtracts the numbers in DI, SI, and BP from the AX register. Store the difference in register BX (4mks)
- (h) Perform the following operations. (i) $128_{10} = (?)_8$ (4mks)
(ii) $256_{10} = (?)_{16}$
- (i) List the registers that are used in register indirect addressing. (2mks)

QUESTION TWO (20 marks)

- (a) What do square brackets mean when they appear in an operand? (2mks)
- (b) Write an assembly language program to move the content in memory location 1100h into register BX and also move to register CX, and also store the content in CX in memory location 1300h (4mks)
- (c) Describe the difference between the instructions: (i) MOV AL, 0AH (ii) MOV AL, AH (2mks)
- (d) What are the various segment registers in 8086? (4mks)
- (e) What is the position of the Stack Pointer after the POP instruction? (2mks)
- (f) What is wrong with these instructions; (i) MOV CS, 2567h (2mks)
(ii) MOV DL, CX
- (g) Explain the structure of assembly language program (4mks)

QUESTION THREE (20 marks)

- (a) Write logical steps to add the following two Hex numbers. Both the numbers should be saved for future use. Save the sum in the accumulator. Numbers: A2H and 18H (5mks)
- (b) Explain the use of the following instructions (i) IDIV (3mks)
(ii) ADC
(iii) INC
- (c) Explain the instruction execution cycle (3mks)
- (d) If BH = 0F3H what is the value of BH in hex after the instruction SAR BH, (4mks)
- (e) Write set of instructions that will store 2Eh in AL register and DDh in DL register. Perform the XOR instruction on these two registers and store the result in BL register (write the comments in each indicating the contents of each register) (5mks)

QUESTION FOUR (20 marks)

- (a) Define opcode and operand, and specify the opcode and the operand using an example of MOV instruction (2mks)
- (b) What is the difference between the NEAR and FAR procedure? Explain. (4mks)
- (c) Explain the data and address bus of 8086 microprocessor (4mks)
- (d) What is an addressing mode? Explain with examples the following
 - (i) Register Addressing mode
 - (ii) Direct addressing mode (5mks)
- (e) Write an assembly language program to demonstrate the use of DIV instruction. (3mks)
- (j) List any two differences between Macro and Procedure (2mks)
- (f) Write an assembly language program to copy data from one segment register to another segment register using general register as an auxiliary (4mks)