CRAWFORD UNIVERSITY FAITH CITY IGBESA

COLLEGE OF NATURAL SCIENCES

DEPARTMENT OF COMPUTER AND MATHEMATICAL SCIENCES

HARMATTAN SEMESTER EXAMINATION

COURSE CODE: ICT 425 COURSE TITLE: MICROCOMPUTER AND MICROPROCESSOR THEORY

UNITS: 3 UNITS **SESSION: 2018/2019**

INSTRUCTIONS:

- **USE YOUR MATRICULATION NUMBER AS THE ONLY MEANS OF IDENTIFICATION ON YOUR ANSWER SCRIPT.**
- **ANSWER QUESTION ONE (1) AND ANY OTHER THREE (3) QUESTIONS TIME ALLOWED – 2.5 HOURS**

QUESTION ONE (24 MARKS)

a. (i) What is a Microprocessor? **(2 Mks)**
   (ii) What are the three (3) reasons for using microprocessors? **(3 Mks)**
b. (i) Draw the block diagram of a basic Microcomputer and describe how it works. **(4 Mks)**
   (ii) Briefly explain the three (3) basic sequences of how a Microprocessor works **(3 Mks)**
c. (i) State the functions of the following terms in a microprocessor viz: 1) Instruction set 2) Bandwidth 3) Clock speed 4) Word length 5) Data types **(5 Mks)**
   (ii) List and explain briefly any six (6) features of a microprocessor. **(6 Mks)**
d. Draw the block diagram stating the Classification of a Microprocessor. **(1 Mk)**

QUESTION TWO (12 MARKS)

a. (i) Identify and briefly discuss any four (4) configurations of 8085 microprocessor architecture. **(4 Mks)**
   (ii) Identify any two (2) applications of 8085 microprocessor. **(2 Mks)**
b. (i) State the functions of the following: 1) Accumulator 2) ALU **(2 Mks)**
   (ii) Which of the two terms in b(i) do you think is linked to memory of the 8085 microprocessor and why? **(2 Mks)**
c. Highlight any four (4) set of flip-flops used in 8085 microprocessors. **(2 Mks)**

QUESTION THREE (12 MARKS)

a. Interpret the following instructions: 1) MVI K, 20F 2) MOV K, B (Indirect addressing mode) 3) LDB 5000K 4) MOV K, B (Register addressing mode) **(4 Mks)**
b. Identify and briefly discuss the two (2) groups of interrupts in 8085. **(4 Mks)**
c. (i) Discuss briefly the following: (and give examples) 1)Maskable interrupt 2) Non-Maskable interrupt 3) Software interrupt and 4) Hardware interrupt **(4 Mks)**

QUESTION FOUR (12 MARKS)

a. Give the meaning of the following opcodes based on the category related to control instructions: 1) NOP 2) HLT 3) DI 4) EI 5) RIM 6) SIM **(1 Mk)**
b. Give the meaning of the following opcodes based on the category related to logical instructions: 1) CMP 2) CPI 3) ANA 4) ANI 5) XRA 6) XRI 7) ORA 8) ORI 9) RLC 10) RRC 11) RAL 12) RAR 13) CMA 14) CMC 15) STC **(3 Mks)**
c. Give the meaning of the following opcodes based on the category related to branching instructions: 1) JMP 2) JC 3) JNC 4) JP 5) JM 6) JZ 7) JNZ 8) JPE 9) JPO 10) CC 11) CNC 12) CP 13) CM 14) CZ 15) CNZ 16) CPE 17) CPO 18) RC 19) RNC 20) RP 21) RM 22) RZ 23) RNZ 24) RPE 25) RPO 26) PCHL 27) RST **(3.5 Mks)**
d. Give the meaning of the following opcodes based on the category related to arithmetic instructions: 1) ADD 2) ADC 3) ADI 4) ACI 5) LXI 6) DAD 7) SUB 8) SBB 9) SUI 10) SBI 11) INR 12) INX 13) DCR 14) DCX 15) DAA **(2.5 Mks)**
e. Give the meaning of the following opcodes based on the category related to Data transfer instructions: 1) MOV 2) MVI 3) LDA 4) LDAX 5) LXI 6) LHLD 7) STA 8) STAX 9) SHLD 10) XCHG 11) SPHL 12) XTHL **(2 Mks)**

QUESTION FIVE (12 MARKS)

a. (i) State the port number of AD0-AD5 **(1 Mk)**
   (ii) State the names of the pins for ports 30-40 **(1 Mk)**
b. (i) State the functions of the following: 1) Power supply and frequency signal 2) READ (RD) 3) RESET 4) TEST 5) M/IO 6) WR 7) HOLD 8) S0, S1 and S2 9) LOCK 10) RQ/ET, & GT0. **(10 Mks)**

QUESTION SIX (12 MARKS)

a. Briefly explain what interface is all about. **(2 Mks)**
b. List and explain all the types of I/O interfacing you know. **(6 Mks)**
c. Draw the block diagram of the I/O interfacing stated in (b). **(4 Mks)**