Subject: ADVANCED MICROPROCESSORS

Time: 3 Hours **Max. Marks: 100**

DECEMBER 2010

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after half an hour of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. Intel's 8086 microprocessor operates at a frequency of _____.

(A) 1 MHz and 50% duty cycle **(B)** 3 MHz and 25% duty cycle
(C) 10 MHz and 33% duty cycle **(D)** 10 MHz and 66% duty cycle

b. Extra Segment in Intel's 8086 microprocessor memory is for _____ storage.

(A) Code **(B)** Data
(C) Stack **(D)** None of the above

c. Size of instructions in Intel's 8086 microprocessor range from _____.

(A) 4 to 6 bytes **(B)** 0 to 6 bytes
(C) 2 to 4 bytes **(D)** 1 to 6 bytes

d. The "I" bit in FLAG register of Intel's 8086 microprocessor is to control _____ interrupt.

(A) TRAP **(B)** NMI
(C) INT **(D)** None of the above

e. In indirect (variable) IO port addressing of Intel's 8086 microprocessor _____ register holds the port address.

(A) AX register **(B)** BX register
(C) CX register **(D)** DX register

f. The tool used to convert source program into an object program is

(A) an assembler **(B)** a loader
(C) a linker **(D)** a monitor

g. Maximum size of a memory segment in Intel's 8086 memory is

(A) 64 Kbytes
(B) 16 Kbytes
(C) 32 Kbytes
(D) 8 Kbytes

h. Intel's 80486 is a _____ bit microprocessor.

(A) 8 bit **(B)** 16 bit
(C) 32 bit **(D)** 4 bit

i. In Intel's 8086 an intersegment branching instruction changes the contents of

(A) CS register only **(B)** IP register only
(C) Both CS & IP registers **(D)** DS register only

j. Pseudo codes or assembler directives find place or appear in

(A) Source file only **(B)** Objects file only
(C) Executable file only **(D)** All of the above files

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. What are the functions of the following pins of INTEL's – 8086? **(6)**

(i) MN/$\overline{\text{MX}}$ (ii) READY
(iii) $\overline{\text{TEST}}$ (iv) $\overline{\text{BHE}}$
(v) CLK (vi) RESET

b. What are the addressing modes available in INTEL's-8086? Explain with an example for each. **(10)**

Q.3 a. Formulate the op-code for **MOV AX, BX** instruction given the 6-bit op-code for MOV is **100010.** **(4)**

b. Correct the following instructions if necessary and indicate its addressing mode

(i) MOV BL, AX (ii) XCHG BL, 83H[SI]
(iii) ROL AX, 04 (iv) ADD 52H[BX],CX
(v) DIV BX, CX (vi) OUT DX,AL **(12)**

Q.4 a. Explain the following instructions of INTEL's-8086.

(i) XLAT (ii) DAA
(iii) STD (iv) SCASB **(8)**

b. What is the response of INTEL's-8086 when interrupted? Explain. Why instruction is used at the end of an interrupt service subroutine instead of RE **(8)**

Q.5 a. What are the functions of the following pins of numeric co-processor-8087?
(i) $RQ/\overline{GT}$ (ii) BUSY
(iii) $S_2\ S_1\ S_0$ **(6)**

b. Explain the following instructions of numeric co-processor-8087.
(i) FST (ii) FDIV
(iii) FABS (iv) FCHS
(v) FLDZ **(10)**

Q.6 a. What are assembler directives? Explain the functions of the following pseudo-codes
(i) ALIGN (ii) DW
(iii) TITLE (iv) END **(6)**

b. Write an assembly language program to sort an array of bytes in ascending order using BUBBLE SORT. **(10)**

Q.7 a. Write an assembly language program to search a key in an array of elements using LINEAR SEARCH method. **(8)**

b. Write an assembly language program to rename a file. **(8)**

Q.8 a. Write an assembly language program by using 8087 instructions to compute the hypotenuse of a right angled triangle. **(8)**

b. Write an assembly language program by using 8087 instructions to compute the resonance frequency (f_o) of a series resonance circuit. **(8)**

Q.9 a. What are the features of INTEL's – 80286 processor? **(6)**

b. With a neat block diagram explain the architecture of Pentium processor. **(10)**