BACHELOR OF INFORMATION TECHNOLOGY EXAMINATION, 2017

(2nd year, 2nd semester)

Microprocessors

Time: 3 Hours

Full Marks: 100

Note: Answer Q. no. 1 and any five from the rest.

1. (i) What is the possible size of a segment?

   (ii) When the 8086 processor is in minimum mode and maximum mode?

   (iii) What are the 8086 instructions used for BCD arithmetic?

   (iv) List the pointer and index registers of 8086 architecture.

   (v) How does the microprocessor differentiate between data and instruction?

   (vi) From which address does the 8086 start execution after reset?

   (vii) What is interrupt vector address of INT 21H?

   (viii) What is wrong with a MOV [SI], [DX] instruction?

   (ix) If CS register contains **30CD$_H$** and IP register contains **5A4B$_H$**, what is the physical address of the instruction to be fetched?

   (x) What is the function of byte queue?   **(10x2)**

2. (a) With a neat diagram, explain the architecture of 8086 microprocessor along with functions of each block and registers.

   (b) Illustrate the concept of segmented memory. Explain the advantages of segmentation.   **(10+3+3)**

3. (a) State and explain instruction format for MOV instruction to transfer data between register and memory. Also generate opcode for the following instruction assuming the opcode for MOV as 100010dw.

   i) MOV AL, BL   ii) MOV AX, [SI+05]

   (b) Explain following assembler directives with examples of each:

   i) PROC and ENDP   ii) DW, DD

   (c) Explain instructions with example of each:

   i) DAA   ii) DIV   iii) CMP   iv) LEA   v) LES   **(3+4+4+5)**

4. (a) Draw and discuss the timing diagram of I/O read cycle of 8086 in minimum mode.

   (b) What are the different types of interrupt possible in 8086 MP?

   (c) Explain the list of steps that an 8086 MP takes to respond to an interrupt.

   (6+4+6)

5. (a) Describe the different operating modes of the 8255 PPI.

   (b) Design an interface between two 16K X 8 EPROMS and two 16K X 8 static RAM chips with 8086. The RAM address must start at 00000H.

(6+10)

6. (a) Write an ALP to clear all control flags of 8086.

   (b) Explain with an example, how parameters can be passed to a subroutine, using stack.

   (c) Compute the factorial of a given 8-bit number using recursion.   **(5+4+7)**

7. (a) Design the hardware interface circuit for interfacing 8251 with 8086. Set the 8251 in asynchronous mode as a transmitter and receiver with even parity enable, 1 stop bit, 8-bit character length, frequency 640 kHz. The address of the port is 0510H. Write an assembly language programming to transmit 100 bytes of data string stored in main memory.

   (b) Interface an input port 74LS245 to read the status of switches SW1 to SW8. The switches, when shorted, input a '1' else input a '0' to the microprocessor system. Store the status in register BL. The address of the port is 0740H.

(8+8)