

2015

M.Sc.

3rd Semester Examination

ELECTRONICS

PAPER—ELC-301

Full Marks : 50

Time : 2 hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

(Microprocessor and its Applications)

Answer Q. No. 1 and any *three* questions from the rest.

1. (a) Explain the function of Opcode prefetch queue in 8086 μ p.
- (b) Differentiate between memory-mapped I/O and I/O-mapped I/O.
- (c) Specify the contents of the accumulator and the CY flag when the following instructions are executed :

MVI A, A7H

ORA A

RAR

RAL

(Turn Over)

- (d) Write down the salient features of IC 8259.
- (e) Show the serial bit format for ASCII character E(45H) at 9600 baud.

5×2

2. (a) Draw and discuss the internal architecture of 8086 μ p.
- (b) What was the reason for developing an externally 8-bit processor like 8088 after 8086, when a 16-bit processor had already been introduced ?

(4+4)+2

3. (a) Interface an 8-bit ADC with the 8085 μ p using memory-mapped I/O and the interrupt RST 5.5.
- b) Write an interrupt routine to read the output data of the converter, store it in memory and continue to collect data for the specified number of times.

6+4

4. (a) A bar code scanner scans the boxes being shipped from the loading dock and records all the codes in computer memory; the end of the data is indicated by the byte 00H. The code 1010 0011 (A3H) is assigned to 19" television sets. Write a program to count the number of 19" television sets that were shipped from the following data set :

Data (H) : FA, 67, A3, B8, A3, A3, FA, 00. 6

(b) Read the following program and answer the questions :

Memory Location (H)	Label	Mnemonics
2000	Main Program :	LXI SP, 2100H
2003		LXI B, 0000H
2006		PUSH B
2007		POP PSW
2008		LXI H, 200B H
200B		CALL 2064H
200E		OUT 01H
2010		HLT
2064	DELAY :	PUSH H
2065		PUSH B
2066		LXI B, 80FF H
2069	LOOP :	DCX B
206A		MOV A, B
206B		ORA C
206C		JNZ LOOP
206F		POP B
2070		RET

- (i) What are the status of the flags and the contents of the accumulator after the execution of the POP instruction located at 2007H ?
- (ii) Specify the stack locations and their contents after the execution of the CALL instruction (not the call subroutine).
- (iii) What are the content of the stack pointer register and the program counter after the execution of the CALL instruction ?

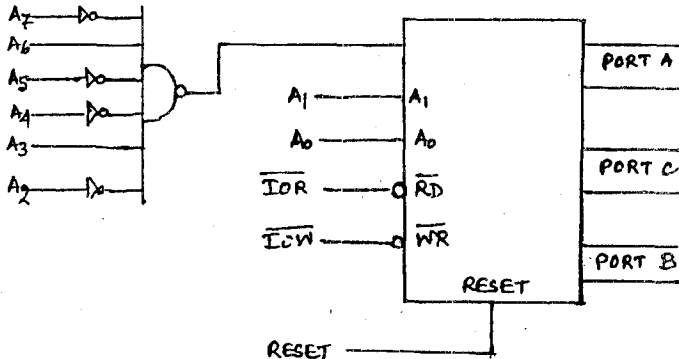
(iv) Specify the memory location where the program returns after the subroutine ?

(v) What is the ultimate fate of the program ?

$$\left(\frac{1}{2} \times 2 + \frac{1}{2} \times 2 + \frac{1}{2} \times 2 + \frac{1}{2} + \frac{1}{2}\right)$$

5. (a) Sketch 8255A block diagram. Distinguish between the three modes of IC 8255A.

(b) Write a BSR control word subroutine to set bits PC₇ and PC₃ and reset them after 20ms. Use the figure shown below and assume that a delay subroutine is available : (4+3)+3



6. (a) What is current loop interface ? Why are current loops used with teletypes ?

(b) Draw and explain current loop teletype interface circuit. (1+2)+(4+3)

[Internal Assessment — 10]