

9. (a) What is the function of the EOC pulse in an ADC?
- (b) Draw and describe the interfacing connection of ADC0804 with 8051 microcontroller. Write an Assembly Language Program to read analog input and store the converted digital output in accumulator.

$$2 + (3 + 3 + 4) = 12$$

MICROPROCESSOR & MICROCONTROLLER
(ELEC 3204)

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

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

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

- (i) Which is not the control bus signal?
(a) READ (b) WRITE
(c) RESET (d) all of these.
- (ii) Which one is the call location of RST6.5 interrupt?
(a) 0024H (b) 0036H
(c) 0034H (d) 002CH.
- (iii) Which interrupt has the highest priority in 8085 microprocessor?
(a) RST 5.5 (b) INTR
(c) RST 7.5 (d) TRAP.
- (iv) In 8051 microcontroller, 1 machine cycle = ____ Oscillator periods.
(a) 1 (b) 10 (c) 99 (d) 12.
- (v) What will happen after execution of the following program in 8085 microprocessor?
MVI A, D2H
ADI 96H
HLT
(a) only carry flag will be set
(b) carry flag and sign flag will be set
(c) zero flag will be set
(d) carry, auxiliary carry and parity flags will be set.

- (vi) What are the values of RS1 and RS0 bits of PSW register in 8051 microcontroller so that register bank 2 will be selected?
 (a) RS1 = 0 & RS0 = 0 (b) RS1 = 0 & RS0 = 1
 (c) RS1 = 1 & RS0 = 0 (d) RS1 = 1 & RS0 = 1.
- (vii) Embedded ROM size in 8051 microcontroller is
 (a) 2K bytes (b) 4K bytes
 (c) 8K bytes (d) 64K bytes.
- (viii) In 8051 microcontroller range of bit addressable area in internal RAM is
 (a) 20H - 2FH (b) 00H - 7FH
 (c) 80H - FFH (d) 00H - FFH
- (ix) The flow of information in address bus is
 (a) bidirectional (b) multidirectional
 (c) unidirectional (d) circular.
- (x) After execution of the following instructions in 8051 microcontroller what will be the content of Accumulator and CY?
 CLR C
 MOV A, #99H
 RLC A
 RLC A
 (a) A = 65H, CY = 0 (b) A = 65H, CY = 1
 (c) A = 32H, CY = 1 (d) A = 32H, CY = 0.

Group - B

2. (a) What do you mean by I/O mapped I/O and memory mapped I/O?
 (b) Describe the detail hardware and software to interface an 8 bit analog to digital converter ADC 0809 with 8085 microprocessor.
 (c) Define the followings: (i) T-States (ii) machine cycle and (iii) Instruction cycle of 8085 microprocessor.
3 + 6 + (1 + 1 + 1) = 12
3. (a) Describe (i) Program counter and (ii) Stack Pointer of 8085 microprocessor.
 (b) Explain the function of each bit of the flag register of Intel 8085 microprocessor.
 (c) Write an assembly language program which will add ten 8-bit binary data stored in memory location starting from F000H. 16-bit result of addition is to be stored in memory location 8000H and 8001H.
(2 + 2) + 3 + 5 = 12

Group - C

4. (a) Write an assembly language program for Intel 8085 microprocessor to generate a square wave.
 (b) Draw the timing diagram of 'OUT 05H' instruction for 8085 microprocessor.
6 + 6 = 12
5. (a) What are the interrupts supported by Intel 8085 microprocessor? Arrange them on the basis of their priority level.
 (b) Explain the software instruction EI and DI of Intel 8085 microprocessor.
 (c) Write a BSR control word subroutine to set bits PC6 and PC3 of 8255 and reset them after 10ms. Assume that delay subroutine is available and address of 8255 CWR is 83H.
(2 + 2) + 2 + 6 = 12

Group - D

6. (a) Explain TCON and TMOD registers of 8051 microcontroller.
 (b) What is relative address and what is the advantage of it?
 (c) Find out the content of TL0 and TH0 for producing 1ms delay using Timer 0 in 16 bit timer mode. Assume that crystal frequency is 12 MHz.
(3 + 3) + 3 + 3 = 12
7. (a) Describe Stack Pointer operation during PUSH and POP operation of 8051 microcontroller.
 (b) Discuss about the role of $\overline{EA}$ pin of 8051 microcontroller.
 (c) Write an assembly language program of 8051 to generate a square wave of 50% duty cycle of frequency 10 kHz through the pin P1.0. Consider the crystal frequency is 12MHz.
4 + 2 + 6 = 12

Group - E

8. (a) Draw the interfacing circuit of 8051 microcontroller with 16×2 LCD and explain properly.
 (b) Write an Assembly Language Program to display 'ELECTRICAL' in the LCD of above-mentioned circuit.
(3 + 3) + 6 = 12