

Total No. of Questions : 5]

SEAT No. :

P-1292

[Total No. of Pages : 2

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S.Y. B.Sc. (Computer Science)

ELECTRONIC SCIENCE

**ELC-231: Microcontroller Architecture and Programming  
(2019 Pattern) (Semester - III) (Paper - I) (23321)**

*Time : 2 Hours]*

*[Max. Marks : 35*

*Instructions to the candidates :*

- 1) *Q.1 is compulsory.*
- 2) *Solve any three questions from Q.2 to Q.5*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*
- 5) *Use of calculator is allowed.*

**Q1)** Attempt any Five :

**[5 × 1 = 5]**

- a) How much is the capacity of internal ROM of 8051?
- b) Name the interrupt which has highest priority in 8051 microcontroller?
- c) What is step size for 8-bit ADC if Vref = 4 volts.
- d) Assembler directive ORG and DB of 8051 stands for?
- e) What is the significance of Gate bit of TMOD register in 8051?
- f) Define step angle of stepper motor.

**Q2)** Answer the following :

**[2 × 5 = 10]**

- a) Explain the operation of following instructions :
  - i) NOP
  - ii) MUL AB
  - iii) CLR C
  - iv) MOV DPTR, # 1234H
  - v) RL A
- b) Draw and explain simplified block diagram of 8051 microcontroller?

*P.T.O.*

**Q3)** Answer the following : **[2 × 5 = 10]**

- a) Write a 8051 C-program to generate 1kHz square waveform on port pin P2.5 using Timer 1, mode 1 (Assume Xtal = 12 MHz).
- b) Explain any 5 addressing modes of 8051.

**Q4)** Answer the following : **[2 × 5 = 10]**

- a) Draw bit format of IE register and write significance of each bit.
- b) Draw a block diagram of interfacing of DAC 0808 and write a C-program to generate sawtooth waveform.

**Q5)** Write a short note on any four of the following : **[4 × 2½ = 10]**

- a) Data transfer instructions (any three).
- b) Parallel ports.
- c) Synchronous communication.
- d) TMOD register.
- e) Difference between Microprocessor and Microcontroller (Any three).

