Total No. of Questions—**4**] [Total No. of Printed Pages—**3**

Seat No.	

[5116]-205

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

EXAMINATION, 2017

ELECTRONICS SCIENCE

Paper I

(ELC-221 : The 8051 Architecture, Interfacing and Programming)

(2013 PATTERN)

Time : Two Hours **Maximum Marks : 40**

N.B. **:—** (*i*) *All* questions are compulsory.

(*ii*) Figures to the right indicate full marks.

(*iii*) Neat diagrams must be drawn wherever necessary.

(*iv*) Use of scientific calculator is allowed.

1. Answer the following in *one* or *two* sentences : [10×1=10]

(*a*) What is the value of program counter after power on reset ?

(*b*) Give *two* unconditional jump instructions with proper syntax.

(*c*) What is the step size of 8-bit ADC, if V_{ref} = 2.56 V.

(*d*) Which pin of LCD is used for controlling the contrast ?

(*e*) What is the difference between instructions MOV R1, 41H and MOV R1, # 41H ?

P.T.O.

(*f*) What is the function of INC and DPTR instruction ?

(*g*) State the role of C/$\overline{T}$ bit in TMOD register.

(*h*) What is the significance of timer flag (TF) in 8051 ?

(*i*) What is size of on chip RAM in 8051 ?

(*j*) Give the use of SMOD bit in PCON register.

2. Attempt any *two* of the following : [2×5=10]

(*a*) Differentiate between microprocessor and microcontroller.

(*b*) Draw a schematic to show how a DAC can be interfaced to 8051. Write a 'C' program to generate a sawtooth waveform.

(*c*) Explain the function of the following instructions :

(*i*) MOV A, @ RO

(*ii*) ADD A, # 80H

(*iii*) RL A

(*iv*) SWAP A

(*v*) CPL bit.

3. Attempt any *two* of the following : [2×5=10]

(*a*) Explain different addressing modes of 8051 microcontroller with suitable example.

(*b*) Write a C program to generate a 5 kHz square wave of 50% duty cycle on port P2.2 line using timer 1, mode 1. Assume crystal frequency = 11.0592 MHz.

(*c*) Explain RAM memory space allocation in 8051.

4. Attempt any *one* of the following : [1×10=10]

(A) (*a*) Draw bit format of IE register and explain function of each bit. [5]

(*b*) List any *three* features of PIC microcontroller. [3]

(*c*) Write an assembly langauge program to toggle all pits of Port 2 continuously. [2]

Or

(B) (*a*) Give differences between asynchronous and synchronous serial communication. [5]

(*b*) Draw a schematic to show how stepper motor can be interfaced to 8051 microcontroller. [3]

(*c*) Explain dual role of Port 0 and port 2 of 8051 microcontroller. [2]