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Paper Code: IC-601	**Roll No.**									

B.Tech.
(SEM VI) EVEN SEMESTER EXAMINATION, 2015-16
MICROCONTROLLERS

[Time: 3 Hrs.] **[Max. Marks: 100]**

Note- ***Attempt All Questions. All Questions carry equal marks*:-**

1. Attempt any FOUR of the following questions: (5x4 = 20)

(a) What is the difference between embedded microcontroller and external memory microcontroller?

(b) What are the features of Harward architecture and Van –Neumann architecture?

(c) Explain the RISC and CISC processors.

(d) Give the list of microprocessors commercially available indicating the following features of each:-

(i) On chip data memory (ii) On chip program memory

(iii) No. of 16-bit timers/counters (iv) I/Os

(e) Discuss the criterion for selecting the suitable microcontroller device.

(f) Draw the generalized functional block diagram of a microcontroller specifying each block.

2. Attempt any FOUR of the following questions: (5x4 = 20)

a) Explain the following pin signals of 8051 microcontroller:- (i) $\overline{\text{PSEN}}$ (ii) $\overline{\text{EA}}$

b) Explain the I/O port structure of port 0 of 8051.

c) Describe different addressing modes of 8051 giving an example of each mode.

d) What is the difference between long jump (LJMP) and short jump (JMP).

e) Explain TMOD and TCON bit structure of 8051 and also define each bit.

f) List the different assembler directives and explain their meaning for the assembler of 8051.

3. Attempt any TWO of the following questions: (10x2=20)

a) What is flash memory? What is the basic difference between 8051 microcontroller and 89C51 microcontroller? Also give the pin configuration of 89C51.

b) Explain the basic features of an 8-bit PIC microcontrollers. What is the purpose of watch Dog Timer (WDT).

c) Explain the architecture of 16-bit microcontroller 8096 with the help of suitable diagram.

4. Attempt any TWO of the following questions: (10x2=20)

(a) How will you connect the following components with the 8051 I/O ports:-

(i) Push buttons (ii) LED's (iii) LCD's

(b) How will you interface the external data memory to 8051? Illustrate each signals clearly.

(c) An 8-bit ADC 0809 is to interface with 8051 microcontroller. Draw the complete circuit diagram along with all necessary components. Write a program in assembly language for ADC operation.

5. Attempt any TWO of the following questions: (10x2 = 20)

(a) Suggest a method for measurement of power and frequency using timer of 8051 with program.

(b) Discuss the control of stepper motor using 8051 microcontroller along with driver circuit and pulse generation.

(c) Write a program in assembly language for 8051 to generate a square wave of 2 MHz. Assume crystal frequency is 12 MHz.