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TIC – 601

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 3097Roll No. **B. Tech.**

(SEM. VI) EXAMINATION, 2006 – 07

MICRO CONTROLLER & EMBEDDED SYSTEM*Time : 3 Hours]**[Total Marks : 100*

- Note :**
- (1) Attempt **all** questions.
 - (2) All questions carry **equal** marks.

- 1** Attempt any **four** parts of the following :
- a) What are embedded microcontrollers and external memory microcontrollers ? Explain and differentiate.
 - b) What are the features of Harvard architecture and Von-Neumann architectures?
 - c) Explain RISC and CISC processors.
 - d) Give a list of microcontrollers commercially available indicating the following features of each – (i) on chip data memory (ii) on chip programme memory (iii) No. of 16 bit timers / counters (iv) I/o.
 - e) Discuss the criteria for selecting the microcontroller device.
 - f) Draw the generalised functional block diagram of a microcontroller specifying each block.

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- 2** Attempt any **four** parts of the following :
- a) Explain the following pin signals of 8051 family microcontroller :
 - (i) \overline{PSEN} (ii) \overline{EA}
 - b) Explain the I/o port structure of part O of 8051.
 - c) Explain TMOD and TCON of 8051 microcontroller.
 - d) Describe addressing modes of 8051 giving an example of each.
 - e) What is the difference between long jump (LJMP) and short jump.
 - f) List the different assembler directives and explain their meaning for the assembler of 8051.
- 3** Attempt any **two** parts of the following :
- a) What is flash memory? What is the basic difference between 8051 microcontroller and 89C51 microcontroller ? Give the pin configuration of 89C2051.
 - 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 block diagram.
- 4** Attempt any **two** parts of the following :
- a) How will you connect the following components to 8051 ports :
 - (i) Push button
 - (ii) LEDs.

- b) How will you interface the external data memory to 8051 illustrating each signal clearly.
- c) An 8 bit ADL 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 operations.

5 Attempt any **four** of the following :

- a) Write a programme in assembly language for 8051 to generate a square wave of 2 kHz. Assume crystal frequency is 12 MHz.
- b) Suggest a method for measurement of power frequency using timer of 8051 with programme.
- c) Explain microcontroller based measurement of angular speed of a shaft with the help of block diagram and flow chart of the algorithm.
- d) Discuss the control of stepper motor using 8051 controller along with driver circuit and pulse generation.
- e) A single phase load is connected to single phase AC source through TRIAC. How will you use 8051 to control firing angle to get variable voltage across the load.
- f) Explain micrometer based PWM control of a DC motor.