



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

**PAPER ID : 132602**

Roll No.

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## B. Tech.

### (SEM. VI) THEORY EXAMINATION, 2014-15 MICROCONTROLLER

Time : 3 Hours]

[Total Marks : 100

Note : ALL questions are compulsory.

- 1 Attempt any four parts: 5×4=20
- a) Draw and explain the functional block diagram of a microcontroller.
  - b) Explain the addressing modes of 8051 microcontroller with suitable example.
  - c) Explain RISC and CISC processor.
  - d) Discuss the advantages of microcontroller over microprocessors in control applications?
  - e) Name the instructions which perform bit level logical operations in 8051. Give an example to show bit level logic operation.

- 2 Attempt any four parts: 5×4=20
- a) Explain the memory organization in 8051 controller.
  - b) Explain the following instructions with suitable examples.
    - i) SWAP
    - ii) MOVX
    - iii) XCHD
    - iv) DAA.
  - c) What is stack? Explain with examples the PUSH and POP instructions.
  - d) How an assembly language program is created, assembled and made ready to run?
  - e) Write an assembly program in 8051 to add two 16 bit numbers stored in external memory. After addition store the results in internal data memory.

- 3 Attempt any two parts : 10×2=20
- a) Explain the importance of interrupt in serial communication. Draw the bit format of TCON register. Which bits of SCON register signify the transmission and reception of data?
  - b) Write an assembly language program to send the text string "AMERICA" to serial #1 set the baud rate at 9600. 8 bit and 1 stop bit using timer1.
  - c) Give the mode word (TMOD) and the control word (TCON) values to perform the following operations:
    - i) Timer 0 in auto reload mode
    - ii) Timer 1 in mode 1.

- 4 Attempt any two parts : 10×2=20
- a) Show the design of 8031 based system with 18K bytes of program ROM, data ROM and data RAM. Also find the address space of data RAM, data ROM and program ROM. Refer to the design write a program to access a byte of data from data ROM, divide it by 2 and save the quotient in the data RAM.
  - b) Interface LCD to 8051 and write an 8051 assembly program to send 'H', 'E', 'L', 'L', 'O' to LCD display.
  - c) Write a program for rotating the stepper motor in anticlockwise direction using half step, 8 step sequences. Draw the connection between 8051 and unipolar stepper motor.
- 5 Attempt any two parts : 10×2=20
- a) Explain about MC68HC 11 microcontroller.
  - b) Design a counter for counting the pulses of an input signal. The pulses to be counted are fed to pin 3.4. XTAL = 22MHz.
  - c) Write a note on various interrupt sources in 8051 microcontroller.
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