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Fourth Semester B.E. Degree Examination, June/July 2017
Microcontrollers

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1
 - a. Give comparison between microprocessor and microcontroller. (06 Marks)
 - b. Explain with neat diagram, Harvard architecture and Van-Neumann architecture. (06 Marks)
 - c. With the help of block diagram, list the specific features of 8051 microcontroller. (08 Marks)
- 2
 - a. Explain the following instructions with suitable examples:
i) MOVX A, @dptr ii) ACALL Target iii) DJNZ R1, up (06 Marks)
 - b. Differentiate between jump and CALL instructions. (06 Marks)
 - c. Write an assembly language program with comments using 8051 mnemonics to convert ASCII to hexadecimal. (08 Marks)
- 3
 - a. Briefly explain the different assembler directives used in an assembly language program. (04 Marks)
 - b. Write an ALP to find the number of negative and positive numbers in a given array of ten bytes of data. The number is available from memory location 8000 h. (08 Marks)
 - c. Write an 8051 software time delay subroutine to generate a time delay of 1 second when called. Assume crystal frequency as 11.0592 MHz. Show delay calculations. Do not use timers? (08 Marks)
- 4
 - a. Explain with a diagram, how the DAC 0808 can be interfaced to 8051 microcontroller. Write an 8051 C program to create the triangular wave. (10 Marks)
 - b. With a neat diagram show how a stepper motor is interfaced to 8051. Write a program to rotate it continuously. (10 Marks)

PART – B

- 5
 - a. Differentiate between a counter and timer. Explain the timer modes of operation in 8051. (04 Marks)
 - b. Assuming that XTAL = 11.0592 MHz, write a program to generate a square wave of 2 kHz frequency on pin P1.5. Use timer 1 and mode 1 operation. Duty cycle = 50%. (08 Marks)
 - c. Explain TMOD and TCON registers with its bit pattern. (08 Marks)
- 6
 - a. Explain briefly the interrupts of 8051, indicate their vector addresses. (05 Marks)
 - b. Explain the format of SCON register in details. (05 Marks)
 - c. Write a program with proper comments to transfer the message "YES" serially at 9600 baud rate, 8 bit data, 1 stop bit. Do this continuously. (10 Marks)
- 7
 - a. Write the steps required for programming 8051 to receive data serially. (08 Marks)
 - b. With a block schematic, explain the features of 8255 PPI chip and its mode of operation. (06 Marks)
 - c. What is the need for serial communication? Explain half duplex and full duplex transmission. (06 Marks)
- 8
 - a. Explain the architecture of MSP 430 CPU with its internal block schematic. (10 Marks)
 - b. Mention the features and functions of the watch-dog timer and explain. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.