

USN

--	--	--	--	--	--	--	--	--	--

10ES42

**Fourth Semester B.E. Degree Examination, June/July 2018**  
**Microcontrollers**

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer FIVE full questions, selecting at least TWO questions from each part.**  
**2. Standard notations are used.**  
**3. Missing data may be suitably assumed.**

**PART – A**

- 1 a. What are the differences between microprocessor and microcontroller? (04 Marks)  
b. Explain in brief Harvard and Von-Neumann CPU architecture. (06 Marks)  
c. With neat block diagram, explain the architecture of 8051. (10 Marks)
- 2 a. Identify the addressing modes used in the following instruction:  
(i) MOV A, @R1      (ii) MOV A, #52h      (iii) MOV A, 50h      (iv) SJMP NEXT  
(v) LJMP 1C00h. (05 Marks)  
b. With an example write the classification of instructions in 8051. (10 Marks)  
c. Explain the different types of Jump instruction in 8051. (05 Marks)
- 3 a. What are assembler directives? Explain any four assembler directives. (08 Marks)  
b. Write a program to subtract two 16-bit numbers in assembly language. (06 Marks)  
c. Find the delay produced by the following program, and assume that clock frequency is 11.0592 MHz.  
Delay : MOV R2, #30  
HERE : DJNZ R2, HERE  
NOP  
NOP  
RET (06 Marks)
- 4 a. Describe with functional block diagram 'Port 0' and 'Port 1' of 8051. (10 Marks)  
b. Write an 8051 C program to turn port line P<sub>0.5</sub> on and off 500 times, with a suitable delay. (05 Marks)  
c. Explain the technique of debouncing a key using a circuit diagram. (05 Marks)

**PART – B**

- 5 a. With a neat diagram, describe the interrupt structure of 8051 and also explain the interrupt control register. (12 Marks)  
b. Describe the mode 1 operation of Timer 0 with timer control logic diagram. (08 Marks)
- 6 a. Explain the function of each bit of SCON register in 8051. (06 Marks)  
b. Write the sequence of actions to be performed for serial data transmission. (06 Marks)  
c. Write the assembly language program to transfer letter C serially at 9600 baud rate continuously. Assume clock frequency of 11.0592 MHz. (08 Marks)
- 7 Write short notes on:  
(i) Clock system of MSP 430      (ii) Real time clock.  
(iii) 8255 PPI      (iv) Features of MSP430. (20 Marks)
- 8 a. Explain the bits of TCON register. Write an 8051 C program to toggle only bit P1.5 continuously every 50 msec. Use timer1 to generate the delay.  
Assume XTAL = 11.0592 MHz. (10 Marks)  
b. Give the control word format of 8255. Write an ALP (Assembly program) to send data 55H and AAH to port B continuously. Assume base address for 8255 as 4500H. (10 Marks)

\* \* \* \* \*

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.