Printed Pages : 1 **Roll No.** | | | | | | | | | | | **NIC601R**

B.TECH.

THEORY EXAMINATION (SEM–VI) 2016-17

MICROCONTROLLERS FOR EMBEDDED SYSTEM

Time : 3 Hours ***Max. Marks : 100***

Note : *Be precise in your answer. In case of numerical problem assume data wherever not provided.*

SECTION A

1. Attempt all parts. **(2 x 10 = 20)**

a. How Microcontroller differ from Microprocessor?
b. Explain indexed addressing modes in MSP430.
c. What are the important characteristics of Embedded system
d. If memory of Microcontroller is Harvard Architecture based then what does it mean.
e. Write down three differences between RISC and CISC architecture.
f. How we can configure port P1.7 in MSP430 with internal pull-up enable.
g. What will be the value of TMOD register in 8051 if we want to configure Timer0 as a counter and in mode1?
h. Explain role of watchdog timer in embedded system.
i. How we can select bank1 register in 8051
j. Explain instruction (1) mov.w @ R5,R6 (2) push.w source

SECTION B

2 Attempt any five questions **(10 x 5 = 50)**

a) Draw the pin diagram of 8051 microcontroller. Briefly describe the function of each pin.
b) (i) Explain the purpose and general operation of the Watch Dog Timer?
(ii) Explain fail safe clocking features of watchdog timer.
c) List the features of MSP430 microcontroller. Describe the Interrupt Processing mechanism of MSP 430 Microcontrollers
d) Draw and explain the simplified block diagram of Comparator_A and also explain the bit patterns of Comparator_A.
e) Explain TMOD and TCON SFR with its bit pattern. Write an ALP to generate a frequency of 100 KHz on pin 2.4. Use Timer 1 in mode 1 and assume clock frequency of 22 MHz.
f) Briefly describe the on chip RAM management mechanism of 8051. Also describe the SFR memory map of 8051 in detail.
g) State the characteristics and application of wireless sensor network.
h) Explain various ways of interfacing LED with MSP430 Microcontroller.

SECTION C

Attempt any two questions **(15 x 2 = 30)**

3. (a) Discuss the different Addressing mode of 8051 with suitable example.
(b)Write an ALP to copy sixteen 8-bit data bytes from memory location stored in memory location 40H to a new memory location starting from 60H.
4. (a) Describe the architecture of MSP430 microcontroller.
(b) Briefly describe the register organization of MSP430 microcontroller.
5. Briefly describe the different communication protocol used in MSP-430 based embedded systems. What is the advantage of API in embedded system designing?