

Dec.-22-0214

EC-506 (Introduction to Microcontroller for Embedded System)

B.Tech. 5th (CBCS)

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt Five questions in all, selecting one question from each section A, B, C & D. Section E is compulsory.

SECTION - A

1. Discuss the various addressing modes of 16-bit microcontroller. (10)
2. (a) Discuss the Harvard architecture of MSP430x5x microcontroller. (5)
(b) Describe the concept of Memory-Mapped Input and Output. (5)

SECTION - B

3. (a) Write a program in assembly language to toggle LEDs using interrupts generated by timer A in up mode. (5)
(b) Discuss the low power operation mode of MSP430 microcontroller. (5)
4. (a) Discuss the MSP430 based watchdog timer scheme of the microcontroller. (5)
(b) Discuss the memory mapped peripherals of the MSP430. microcontroller. (5)

SECTION - C

5. Write a program to configure the Real-Time Clock and handle interrupts from Basic Timer 1. (10)

6. (a) Discuss the concept of programming for optimal power consumption while using peripherals. (5)
(b) Discuss the concept of measurement of timing sequence using Capture mode. (5)

SECTION - D

7. Discuss in detail, the communication peripherals in the MSP430. (10)
8. Discuss various asynchronous interfaces used for the microcontroller. (10)

SECTION - E

9. Explain the following:
 - (i) What is volatile and non-volatile memory?
 - (ii) What is von Neumann Architecture of MSP430 microcontroller?
 - (iii) Where does the MSP430 microcontroller fit?
 - (iv) What is Watchdog timer? Write its applications.
 - (v) Write a program in assembly language to light LEDs with a constant pattern.
 - (vi) What do you mean by Subroutine? Discuss its concept.
 - (vii) Write the various applications of interrupts in microcontroller.
 - (viii) What do you mean by Successive Approximation technique of ADC?
 - (ix) What is the Real-Time Clock control register?
 - (x) Discuss the operation of USI in Serial peripheral interface. (10×2=20)