USN ☐☐☐☐☐☐☐☐☐☐

15EC555

# Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020
## MSP 430 Microcontrollers

Time: 3 hrs.                                                                 Max. Marks: 80

**Note:** *Answer any FIVE full questions, choosing full question from each module.*

### Module-1

1  a. Differentiate between Harvard and Von-Neumann architecture with diagram. **(06 Marks)**
   b. Sketch the functional block diagram of MSP430 microcontroller and briefly explain its architecture. **(10 Marks)**

### OR

2  a. Explain briefly about register set of MSP430 CPU. **(06 Marks)**
   b. Show the memory map of MSP430 and explain briefly with address. **(08 Marks)**
   c. Describe the storage methods of little endien mode and big endian mode. **(02 Marks)**

### Module-2

3  a. Define an addressing mode. Explain status register of MSP430 in detail. **(06 Marks)**
   b. With an example explain the different addressing made of data available for MSP430. **(10 Marks)**

### OR

4  a. Explain logic instruction with one operand and two operand with syntax. **(08 Marks)**
   b. Explain arithmetic instruction and shift, rotate instruction. **(08 Marks)**

### Module-3

5  a. Explain the clock systems of MSP430 with the help of its simplified block diagram. **(10 Marks)**
   b. Which are the low power operating modes of MSP430? Explain them briefly. **(06 Marks)**

### OR

6  a. List steps what happen when an interrupt is requested. **(06 Marks)**
   b. Explain the operation and men of WDT in MSP430 with the help of WDTCTL. **(10 Marks)**

### Module-4

7  a. Explain architecture and operation of comparator – A+ of MSP430 with the help of block diagram. **(10 Marks)**
   b. Explain simplified block diagram of ADC10 and brief about each component. **(06 Marks)**

### OR

8  a. Explain the operation of sigma–delta ADC of MSP430 with its block diagram. **(08 Marks)**
   b. With an example explain simple PWM wave can be generated using MSP430 CPU. **(08 Marks)**

### Module-5

9  a. Explain serial peripheral interface between a master and a single slave with signals. **(06 Marks)**
   b. Describe the formats of asynchronous transmitter and RS232 standards. **(10 Marks)**

### OR

10  a. Write a program to flash LED's with frequency of roughly 1 Hz a s/w delay. **(10 Marks)**
    b. Explain the process of hardware to drive LCD and LCD – A controller. **(06 Marks)**

* * * * *