CBCS SCHEME

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15EC555

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
MSP430 Microcontroller

Time: 3 hrs. Max. Marks: 80

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

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.

Module-1

1 a. Explain the architecture of MSP430 microcontroller with its functional block diagram. **(10 Marks)**

b Show the memory map of MSP430 and explain it briefly. **(06 Marks)**

OR

2 a. Explain the common peripherals included in the microcontrollers. **(04 Marks)**

b. Explain the bits of the status register with its format. **(06 Marks)**

c. Explain the Harvard and Von-Neumann architectures of a system. **(06 Marks)**

Module-2

3 a. Explain the following instructions :

i) RRC src
ii) Swpb src
iii) bic.w src, dst
iv) DECD.w dst
v) PUSH.w src
vi) DADD.w src, dst **(06 Marks)**

b. Explain the addressing modes of MSP430 microcontroller and give an example each. **(10 Marks)**

OR

4 a. Write a program to exchange n bytes of data between two memory locations 20h and 30h. **(08 Marks)**

b. Explain the machine code format – 1 instruction of MSP430 and also generate the machine code for the instruction ADD.W R5, R6. **(08 Marks)**

Module-3

5 a. Explain the clock system of MSP430 with the help of its simplified block diagram. **(10 Marks)**

b. Explain the various low power operating modes of MSP430 Microcontroller. **(06 Marks)**

OR

6 a. Draw the simplified block diagram of Basic Timer – 1 and explain its operation. Also draw its control register BTCTL. **(08 Marks)**

b. Explain the two control register used in Timer_A along with their formats. **(08 Marks)**

Module-4

7 a. Explain the architecture of Comparator_A+ of MSP430 with neat diagram. **(08 Marks)**

b. Draw the block diagram of Sigma – Delta ADC and explain its operation. **(08 Marks)**

OR

8 a. List the principal distinctions between the ADC10 and ADC12 Successive Approximation ADC's. **(06 Marks)**

b. Explain the design of simple PWM along with the program. **(10 Marks)**

Module-5

9 a. Explain the working principle of serial peripheral interface (SPI) between a master and a single slave along with the diagram. **(08 Marks)**

b. Explain the functions of different registers associated with the digital Input/output pins of port P1 of MSP430 Microcontroller. **(08 Marks)**

OR

10 a. Explain the format of asynchronous serial data communication with an example. **(08 Marks)**

b. Write the flow diagram for lighting LED when button B1 is pressed for single loop containing a decision and also write the C program. **(08 Marks)**

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