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10ES42

Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019

Microcontroller

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain with a neat block diagram architecture of 8051 microcontroller. **(12 Marks)**

b. Explain Harward and Von-Neumann CPU architectures with necessary diagrams. **(08 Marks)**

2 a. Explain the different addressing modes supported by 8051 μc with an example for each. **(10 Marks)**

b. Correct the following instructions if found to have any wrong syntax. Explain the operation of the corrected instructions:

(i) MOVx R0, @ R1 (ii) MOV A, # B (iii) MOV 77h, A8H

(iv) XCHG A1, R2 (v) ADD A, @B **(10 Marks)**

3 a. Write a program that computes the number of zeros in the following 16-bit stream:
0 1 0 1 1 0 1 0 0 1 0 1 1 0 1 0 **(10 Marks)**

b. Assume Timer 1 is operating in mode 1. It is required to schedule a new task after 0.05 second. If the timer oscillator operates at 10.0 MHz, how should the timer registers be configured for this operation. **(10 Marks)**

4 a. Draw the internal structure of port '0' and explain its operation. **(10 Marks)**

b. Write a 'C' program to monitor the status of a switch 'SW' connected to pin P2.7 and perform the following:
i) If SW = 0, the stepper motor rotates clockwise
ii) If SW = 1, the stepper motor rotates counter clockwise (ACW)
Use the wave drive 4-step sequence. **(10 Marks)**

PART – B

5 a. Explain interrupt vector table. **(10 Marks)**

b. Write the bit pattern of TCON SFR and explain. **(10 Marks)**

6 a. How many types of serial communications are there? Name them and explain each type. **(10 Marks)**

b. Write a program to serially transmit the message 'GOOD' continuously at a baud rate of 9600, 8-bit data and 1 stop bit. **(10 Marks)**

7 a. With a neat block diagram, explain the architecture of MSP 430 μ controller. **(10 Marks)**

b. Explain with an example of MOV instruction the different addressing modes of MSP430. **(10 Marks)**

8 a. Assume that a 60 Hz external clock is being fed into pin T1 (P3.5). Write an 8051 C program for counter 1 in mode 2 to display the seconds and minutes on P1 and P2 respectively. **(10 Marks)**

b. Explain the importance of TI and RI flag used in serial data transfer. **(10 Marks)**

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