

CBCS Scheme

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15EE52

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018 Microcontroller

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Discuss the need for stack memory in microcontroller. How stack is operated in 8051 μ c? What is the default location of stack? (06 Marks)
- b. With an example explain the various addressing modes used in 8051 μ c (any four). (06 Marks)
- c. Compare RISC and CISC micro controllers. (04 Marks)

OR

- 2 a. Explain the bit pattern of program status word. (06 Marks)
- b. With a neat diagram, explain the steps to interface 8K bytes of program ROM and 6 K bytes of data ROM to 8031 based system. (06 Marks)
- c. Identify the addressing modes of the following instructions:
i) MOV C, A, @ A+DPTR
ii) MOV DPTR, #1234
iii) MOV A, 4
iv) CLR C (04 Marks)

Module-2

- 3 a. Write a program to find the square root of a given number. (06 Marks)
- b. With a neat diagram explain the range of JUMP and CALL instructions. (08 Marks)
- c. Explain the following instructions: i) DA A, ii) ANL C, P2.5 (02 Marks)

OR

- 4 a. What are assembler directives? Explain any four of them with an example. (06 Marks)
- b. Assume that register 'A' is loaded with number 'N' (any integer value from 0 to 255). Write a program to count the number of ones in even numbered bits of accumulator. (05 Marks)
- c. Write a program to complement the content of accumulator 62500 times. (05 Marks)

Module-3

- 5 a. Explain the different data types supported by 8051C microcontroller. (08 Marks)
- b. Write a program to create a square wave of 100 Hz with a duty cycle of 80% on port 1.1. Use timer '0' and operate that timer '0' in mode '1'. Assume XTAL $f_{mov} = 12$ MHz. (08 Marks)

OR

- 6 a. A switch is connected to pin P1.2. Write an 8051 C program to monitor 'SW' and create the following frequencies on pin P1.7.
SW = 0 : 500 Hz
SW = 1 : 750 Hz
Use timer '0', mode '1' for both of them. Assume crystal frequency = 11.0592 MHz. (08 Marks)
- b. Write an 8051C program to toggle bit P1.5 ON and OFF 50000 times. (03 Marks)
- c. Write a program for counter '1' in mode '2' to count the clock pulse and display the state of the TL, count on P2. (05 Marks)

Module-4

- 7 a. Write a program to retrieve the data serially and put them in P1. Set the band rate at 4800, 8-bit data and one stop bit. (06 Marks)
- b. Write an 8051C program to transfer the message "INDIA" serially at 9600 band rate, 8 bit data and one stop bit, continuously. (06 Marks)
- c. Explain the importance of TI and RI flags. (04 Marks)

OR

- 8 a. What is an interrupt? List the various interrupts of the 8051 with their corresponding vector address. (06 Marks)
- b. Write a program that continuously gets 8-bit data from 'P0' and sends it to 'P1' where simultaneously creating a square wave of 200 μ s period on pin P2.1. Use timer '0' to create square wave. Assume $K_{TAL} = 11.0952$ MHz. (07 Marks)
- c. Explain simplex, half duplex and full duplex serial data transfer. (03 Marks)

Module-5

- 9 a. A switch is connected to pin P2.7. Write a 'C' program to monitor the status of 'SW' and perform the following:
 i) If SW = 0 : the stepper motor moves clock wise. (10 Marks)
 ii) If SW = 1 : the stepper motor moves counter clock wise. (06 Marks)
- b. Explain the control word format of 8255.

OR

- 10 a. Explain the various modes of 8255 and find the control word for following configurations:
 i) All ports of A, B and C are O/P ports (mode '0') (08 Marks)
 ii) PA = IN, PB = OUT, PCL = OUT and PCH = OUT. (08 Marks)
- b. Explain the steps to interface ADC 0808 to the 8051 microcontroller. (08 Marks)

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