

CBCS SCHEME

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15EC563

Fifth Semester B.E. Degree Examination, June/July 2018 8051 Microcontroller

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Differentiate between microprocessor and microcontroller with respect to their architecture and instructions. (06 Marks)
- b. With a diagram, explain the architecture and features of 8051 Microcontroller. (10 Marks)

OR

- 2 a. What is an embedded system and embedded microcontroller? (02 Marks)
- b. Explain the oscillator circuit and a machine cycle of 8051 microcontroller. (06 Marks)
- c. Explain the internal memory organization in 8051. (08 Marks)

Module-2

- 3 a. Explain the different addressing mode of 8051. Give an example for each one of them. (08 Marks)
- b. Mention the function of the following instructions of 8051 CPU :
i) `MOV A, @A+DPTR` ii) `DA A` iii) `SJMP rel` iv) `DJNZ Rn, rel`. (05 Marks)
- c. Explain the functions of following pins of 8051: i) \overline{ALE} ii) \overline{EA} iii) \overline{RST} . (03 Marks)

OR

- 4 a. Explain all the formats of XOR and AND operations in 8051. (06 Marks)
- b. Which of the following 8051 instructions are wrong and why?
i) `MOV A, @R3`
ii) `MOV R1, R2`
iii) `ADD 10H, 11H`
iv) `INC DPTR`. (04 Marks)
- c. Assume that register A has packed BCD, write an 8051 ALP program to convert packed BCD to two ASCII numbers and place them in address 60_H and 61_H . (06 Marks)

Module-3

- 5 a. With a neat diagram, explain the sequence of events of PUSH, POP, ACALL and RET instructions stack area of internal RAM. (08 Marks)
- b. Write an ALP to find average of 10 numbers stored in external memory from 1000_H . Store result at 2000_H . Assume sum of those 10 numbers does not exceed 8 bits. (08 Marks)

OR

- 6 a. Write an ALP to find largest of five 8 bit numbers (without sorting) stored from location 20_H . (08 Marks)
- b. Write an ALP to move block of 10 data from internal data memory 30_H to external data memory 9000_H . (08 Marks)

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.

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Module-4

- 7 a. Distinguish between counter and timers of 8051. Explain the mode 1 and mode 2 operation of timer/counter of 8051. How to start/stop timers of 8051. (08 Marks)
- b. Write an ALP to generate a rectangular wave with an ON time of 3ms and an OFF time of 10ms on all pins of port 0. Assume XTAL of 22MHz. Use timer0 in mode 1. (08 Marks)

OR

- 8 a. Explain the functions of RS232 pins of DB-9 connector. (04 Marks)
- b. Explain the procedure 8051 follows to transmit and receive characters serially. (06 Marks)
- c. Write a program for 8051 to transfer the message "GOOD LUCK" serially at baud rate of 9600, 8 bit data with 1 stop bit. Do this continuously, use assembly language. (06 Marks)

Module-5

- 9 a. Explain 8051 interrupts and the procedure to enable/disable/mask them. (08 Marks)
- b. Write a C-program that continuously gets a single bit of data from P_{1.7} and sends it to P_{1.0}, while simultaneously creating a square wave of 200 μ s period on pin P_{2.5}. Use timer0 to create the square wave. Assume XTAL = 11.0592 MHz. (08 Marks)

OR

- 10 a. Show an interface of 8051-Microcontroller with a stepper motor drive circuit and write an ALP to rotate it 5 steps counter clockwise. (08 Marks)
- b. Interface ADC-0804 to 8051-Microcontroller and write a program in assembly level to read analog data and display the converted data at Port 2. (08 Marks)

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