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10MT54

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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. Compare the CPU architectures:
i) CISC and RISC ii) Microprocessor with microcontroller (06 Marks)
- b. With neat diagram, explain the internal architecture of 8051. (07 Marks)
- c. Interface 8051 to external ROM and RAM and explain how 8051 access them. (07 Marks)
- 2 a. What are addressing modes? Explain different addressing modes of 8051 with an example for each. (08 Marks)
- b. Explain the operation performed by the following instructions :
i) DA A ii) MUL AB iii) XCHD A, @ Ri iv) MOVX A, @ DpTR. (08 Marks)
- c. Write a program to put the number 34h in Registers R4, R5, R6 & R7 using any two addressing modes. (04 Marks)
- 3 a. Explain various types of jump and call instructions. (08 Marks)
- b. Write an ALP to toggle all the bits of port 1, with a time delay between toggling by using subroutine concept, with an example. (06 Marks)
- c. What is interrupt? Explain the interrupt structure of 8051 with their default priorities. (06 Marks)
- 4 a. Explain different C data types for 8051 with their data size in bits and data range. (07 Marks)
- b. Write a 8051 C program to convert packed BCD number OX29 to ASCII and display the result on P₁ and P₂. (06 Marks)
- c. Explain the different Bit wise logical operators possible when 8051 is programmed in C. (07 Marks)

PART – B

- 5 a. What is the difference between timer and counter? How to start/stop the timer/counter of 8051. When (i) GATE control is not used, (ii) GATE control is used. (08 Marks)
- b. Explain TMOD and TCON registers with its bit pattern. (06 Marks)
- c. Write a 8051 ALP programs to generate frequency of 100 kHz on pin P2.3 use timer 1 in mode 1 with a frequency of 22 MHz. (06 Marks)
- 6 a. What is RS 232 standard, explain the RS 232 hand shake signals. (08 Marks)
- b. Write the steps to program in 8051 to transfer and receive data serially. (06 Marks)
- c. Write a C program to send the two messages “Normal speed” and “High speed” to the serial port. Assuming that SW is connected to pin P2.0 monitor its status and set the band rate as follows: SW = 0, 28,800 Band Rate, SW = 1, 56K Band Rate. Assume that XTAL = 11.0592 MHz for both cases. (06 Marks)
- 7 a. Explain IP and IE register of 8051. Mention their significance. (10 Marks)
- b. Explain the different Interrupts of 8051, with the priority and Interrupts vector table. (07 Marks)
- c. Differentiate between Polling & Interrupt. (03 Marks)
- 8 a. With interfacing diagram, write a program to rotate a stepper motor clockwise. (10 Marks)
- b. Interface an LCD display unit to 8051 and write an ALP to display the message “EXAM”. (10 Marks)

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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.