

CBCS SCHEME

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18EE52

Fifth Semester B.E. Degree Examination, July/August 2021 Microcontroller

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Draw and explain the memory structure of 8051. (10 Marks)
b. Draw and explain program status word register of 8051 μ c. Calculate the status of carry, auxiliary carry and parity flags after the addition of (i) 55h and 52h (ii) 91h and 92h (10 Marks)
- 2 a. Draw and explain 8051 connection to interface 8K external RAM and 32 K external ROM. (10 Marks)
b. With an example, explain any four addressing modes used in 8051. (06 Marks)
c. Identify the addressing modes of the source operand (i) MOV A, #2 ch (ii) MOV A, @ RO (iii) Add A, 50h (iv) MOV C A, @ A + dptr (04 Marks)
- 3 a. Define Assembler directives. Explain DB, ORG, EQU, END, IDATA, XDATA. (10 Marks)
b. Write a program to complement the content of accumulator 62500 times with comments. (05 Marks)
c. Write a subroutine to find factorial of a given number. (05 Marks)
- 4 a. Explain the following instructions with an example (i) DA A (ii) MOV C (iii) SJMP. (08 Marks)
b. Write an ALP to toggle all bits of P0 continuously with explanation. (06 Marks)
c. Write a delay subroutine using ALP to generate 10 msec. (06 Marks)
- 5 a. Explain the different data types supported by 8051 C with its range. (05 Marks)
b. Write an 8051 C program to get a byte of data from P1 and then send it to P2. (05 Marks)
c. Write an 8051 C program to generate a rectangular wave of 2 kHz with 60% duty cycle in pin P1.2. Use timer '0' in mode 1 operation. Show delay calculations. (10 Marks)
- 6 a. Explain Mode 1 programming of 8051 timer. Describe the different steps to program in Mode 1. (10 Marks)
b. Write an 8051 C program to find the check sum byte of data stream 30 H, 46 H, 5AH, 18 H and display the BCD digits in port P0, P1 and P2. (10 Marks)
- 7 a. Write an 8051 ALP to transfer "HELLO" serially at 9600 band rate. (05 Marks)
b. Describe bit status of SCON register. (05 Marks)
c. Write the steps to transfer data serially and receive data serially. (10 Marks)
- 8 a. Explain the different interrupts in 8051 showing the 8051 Interrupt Structure Diagram. (10 Marks)
b. Write a C program that continuously receives a single bit of data from P1.0 and sends it to P2.0, while simultaneously creating a square wave of 400 μ sec period on pin P2.5. Use timer '0' to create the square wave. Assume XTAL = 11.0592 MHz. (10 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.

- 9 a. With a neat Interfacing diagram, write an 8051 C to display letters 'B', 'Y' and 'E' to the LCD using delays. (10 Marks)
- b. Explain the construction and working of Stepper motor along with 4 step sequence table, step angle and steps per revolution. (10 Marks)
- 10 a. With a block diagram, explain 8255 PI chip. Also explain the control word format. (10 Marks)
- b. Write an 8051 C program to read the state of switch connected to P1.0. If low, apply 50% of power otherwise apply 75% of power to DC motor connected to pin 2.0 through optocoupler. Use PWM technique. (10 Marks)
