Learning Resource Centre
KLE's Institute of Technology

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10MT54

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022
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 Vonneumann and Harvard architectures. **(04 Marks)**

b. Draw the internal block schematic of 8051 microcontroller. Explain its characteristics. **(10 Marks)**

c. Explain the internal memory organization of 8051 microcontroller. **(06 Marks)**

2 a. Explain the different addressing modes of 8051 with examples and mention their limitations. **(10 Marks)**

b. Explain the following instructions with suitable examples : i) SWAP A ii) RL A iii) MOVC A, @A+PC iv) XCHD A, @Ri v) DAA **(10 Marks)**

3 a. Briefly explain the various types jump instruction. **(06 Marks)**

b. What is subroutine? Discuss the subroutine instruction with execution steps. **(08 Marks)**

c. Write an ALP to generate Fibonacci series upto given value 'n' and store all the n bytes starting from memory location 30h. **(06 Marks)**

4 a. Explain the various data types in C. **(06 Marks)**

b. Calculate the period of machine cycle for the following crystal frequency with respect to 8051 system i) f_{osc} = 11.0592 MHz ii) f_{osc} = 16 MHz iii) f_{osc} = 24 MHz. **(06 Marks)**

c. Write a C program to convert ASCII digit of '3' and '6' to packed BCD and display them on P_2. **(08 Marks)**

PART - B

5 a. What is timer? Explain basic timer/counter diagram and also write the bit pattern of TMOD register. **(08 Marks)**

b. Briefly explain the various modes of timer. **(06 Marks)**

c. Write a C program to generate frequency of 2.5 kHz on pin P1.2, use Timer 1, mode 2 to create a delay. **(06 Marks)**

6 a. Give difference between synchronous and asynchronous serial communication. Explain the significance of SCON register in detail. **(08 Marks)**

b. Write a ALP to transfer the message "BELGAUM" serially at 9600 baud rate 8 bit data, 1 stop bit. **(06 Marks)**

c. Write the steps required to program 8051 to transfer data serially. **(06 Marks)**

7 a. What are interrupts and interrupt subroutine? Explain IE and IP special registers with their bit pattern. **(10 Marks)**

b. Explain the five interrupts of 8051, with their priority and interrupt vector table. **(07 Marks)**

c. Give difference between interrupt and polling. **(03 Marks)**

8 a. Show the interfacing circuit and functional pins of LCD. Write a C program to interface LCD with 8051 to display message "INDIA". **(10 Marks)**

b. Describe the 8051 connection to stepper motor and write a program to rotate the motor clockwise direction. **(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.