Reg. No. | | | | | | | | | | |

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

FIFTH SEMESTER B.TECH. (ELECTRONICS & INSTRUMENTATION ENGG.)

END SEMESTER DEGREE EXAMINATIONS, MARCH - 2021

MICROCONTROLLERS [ICE 3152]

25-03-2021

TIME: 3 HOURS MAX. MARKS: 50

Instructions to candidates :*Answer ALL questions and missing data may be suitably assumed.*

1A. i) In a given byte addressable computer, memory locations 10000H to 9FFFFH are available for user programs. Calculate the total number of kilobytes.

ii) What is the function of the stack pointer? Specify what happens if a program needs to access more than 24bytes of stack?

1B. i) List the three types of buses in computer systems and mention the purpose of each type of bus.

ii) Illustrate the difference between MOVC and MOVX operations.

1C. Illustrate with example i) Register banks in 8051 ii) Push and Pop operations on stack.

(3+3+4)

2A. Write an 8051 ALP to find y where $y = (x + 10)(2x + 5)$ and x is a number between 0 and 7.

2B. With a neat block diagram explain the working of 4x4 Keypad scanner.

2C. Write a program to accept 5 BCD numbers from port 0. Add the numbers and send the result to port 1.

(2+3+5)

3A. Specify significance of interrupts in 8051.

3B. Write the format of TMOD register. Explain significance of each bit in the register.

3C. Write a program to transfer the message "GOOD" serially at the rate of 4800Baud, 8-bit data and with 1 stop bit. The message should be transmitted continuously.

(2+3+5)

4A. Explain the meaning of TDMI in ARM processors. List any four features of ARM processors.

4B. What are the different operating modes in ARM processors? How the programmer's model is designed for different operating modes.

4C. Write a note on block data transfer in ARM processors. Illustrate the instructions used for block data transfer.

(2+3+5)

5A. Mention any two applications of GPIO feature in LPC2148 Microcontrollers. Specify the registers used for this purpose.

5B. Define resolution in timers. How the timer resolution is achieved in LPC 2148.

5C. List any four features of LPC2148 microcontrollers. Develop the code for LPC2148 to generate a square waveform at P0.15, with 25% duty cycle.

(2+3+5)

****