VIT

Reg. No. :

Final Assessment Test (FAT) - APRIL/MAY 2023

Programme	**B.Tech**	Semester	**Winter Semester 2022-23**
Course Title	**MICROPROCESSORS AND MICROCONTROLLERS**	Course Code	**BECE204L**
Faculty Name	**Prof. Manoj Kumar R**	Slot	**F1+TF1**
		Class Nbr	**CH2022235002444**
Time	**3 Hours**	Max. Marks	**100**

Part - A (1 X 5 Marks)
Answer All questions

01. Discuss the features of the microprocessor that addresses 1MB of memory. **[5]**

Part - B (6 X 10 Marks)
Answer All questions

02. Give a systematic analysis to discuss the memory segmentation of the 8086 microprocessor with a neat diagram. **[10]**

03. Write an 8086 assembly language program to find whether the given 8-bit number stored in 3000H is positive or negative. If the number is even, store 11H in memory location 8000H, else, store AAH in memory location 8000H. **[10]**

04. Classify the instruction sets of 8051 Microcontroller according to its function and discuss them with at least two examples in each. **[10]**

05. Analyze the below program and find the values of A, R1 and R2 in each instruction when the value stored in 45H is 25. Also, find the value stored in 55H after the execution of the program. **[10]**

```
ORG 0000H
MOV R0, #45H
MOV R1, #01H
MOV R2, #00H
MOV A, @R0
LOOP: SUBB A, R1
INC R2
JZ ANSWER
JC FALSE
INC R1
SJMP LOOP
FALSE: MOV 55H, #0FFH
L1: SJMP L1
ANSWER: MOV 55H, R2
L2: SJMP L2
END
```

06. Assume that the bank account balances are encoded with hexadecimal values ranging from 00H to FFH. Write an 8051 ASM program to check the account balance of an account holder. Read the account balance through port P2. If the account has zero balance, transmit the data "Nil **[10]**

Balance" serially at a baud rate of 19200, otherwise, send the data "FFH" to port P1. Assume the crystal frequency is 12 MHz.

07. Let R1 = 0X00000030, R2 = 0X00002020, and R3 = 0X00000002 [10]
Write the values stored in the registers after executing the following instructions.
a. MOV R0, R2, LSR #2
b. MOV R0, R2, RRX
c. RSB R0, R1, R2
d. BIC R0, R1, R2

Part - C (1 X 15 Marks)
Answer All questions

08. Discuss the various registers and processor modes present in the ARM processor. [15]

Part - D (1 X 20 Marks)
Answer All questions

09. Design a token display system using an 8051 Microcontroller for VIT-GYM Khaana with the following functionalities: [20]
- Read the token number entered by the service person in the 4x4 matrix keypad interfaced with 8051. The rows and columns are connected to the ports P1 and P3, respectively.
- Display the entered token number on the LCD unit. The port P0 is connected to LCD data pins, the port pins P2.0, P2.1, and P2.2 are connected to RS, R/W, and E pins of LCD, respectively.

Draw the necessary schematic and write an 8051 assembly language program for the specified requirements. Assume the maximum value of the token number as 99.