VIT Vellore Institute of Technology

Reg. No. : 21BPS1364

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. Ravi Tiwari	Slot	F2+TF2
		Class Nbr	CH2022235002461
Time	3 Hours	Max. Marks	100

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

01. Discuss the features of the microprocessor that addresses 64 KB of memory [5] 5

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

02. Give a systematic analysis to discuss the 8086 microprocessor in terms of BIU, EU and flags with a neat block diagram. [10] 10

03. Write an 8086 assembly language program to find whether the given 8-bit number which is available in 1220H is odd or even. If the number is even, store 00H in memory location 1234H, else, store FFH in memory location 1234H. [10] 5

04. Discuss the different types of addressing modes of 8051 microcontroller with at least two examples. [10] 8

05. The aim of the below program is to flash the LEDs connected to the port P2 with a delay of 10 seconds and simultaneously read data from port P0 continuously and send it to port P1. Use timer 0 in mode 1 with interrupt concept. Fill in the blanks with the appropriate vector address, values and registers. [10] 5

```
ORG 0000H
LJMP MAIN
ORG _____
CPL ___
MOV ___, A

_____
MAIN: MOV ____, #01H
MOV TH0, #____
MOV TL0, #____
MOV IE, #____
MOV P2, #00H
MOV P0, #____
BACK: MOV ____, P0
MOV P1, A
SJMP BACK
```

06. Assume the clock frequency is 12 MHZ. Analyze the below code snippet and find the on time and off time of the waveform generated at P3.0. [10] 5

```
ORG 0000H
```

```
        CLR P3.0
        MOV TMOD, #20H
        MOV TH1,-250
        SETB TR1
AGAIN: JNB TF1, AGAIN
        CPL P3.0
        CLR TF1
        SJMP AGAIN
        END
```

Modify the above code with necessary additional instructions to generate a 75% duty cycle waveform at P3.0.

07. Let R1 = 0X00000030 [10]
R2 = 0X00000500
R3 = 0X00000006
Write the values stored in the registers after executing the following instructions.
a) MOV R1, R2, LSL #3
b) MOV R0, R2, ROR #4
c) ADD R0, R1, R2, LSL R3
d) ORR R0, R1, R2

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

08. Draw and discuss in detail about the various blocks present in the architecture of ARM processor [15]

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

09. Assume that the Government of India reports the statistics of mortality rate due to infectious diseases in the given Table. [20]

Disease No.	Infectious Disease	Number of Death
1	CORONA	100
2	H3N1 FLU	120

Design an 8051 based microcontroller system, for displaying the statistics. The selection of disease can be entered through a 4-key in keypad. The rows and columns of the keypad are connected to the ports P0 and P1, respectively. The keys are organized in 2x2 matrix. When the disease number is entered through keypad, the program must be capable of recognizing the disease and display its name and number of death in LCD. The port P2 is connected to LCD data pins, the port pins P3.0, P3.1, and P3.2 are connected to RS, R/W, and E pins of LCD, respectively. Draw the necessary schematic and write an 8051 ASM program to implement the same.