

**VIT**

Vellore Institute of Technology

Final Assessment Test – November 2019

Course: ECE3003 - Microcontroller and its Applications

Class NBR(s): 0952 / 0956 / 0963 / 0977 / 0981

Slot: E1

Time: Three Hours

Max Marks: 100

KEEPING MOBILE PHONE/SMART WATCH, EVEN IN 'OFF' POSITION, IS EXAM MALPRACTICE**General Instructions :** Show calculations at appropriate places and write comments for all the instructions in all the programs.**Answer ALL Questions****(100 Marks)**

1. Explain the Architecture of 8086 processor with neat diagram and list its features. [10]

2. With neat diagram, explain the Organization of 8051 RAM. [5]

3. With neat diagram and assembly language program, explain the operation of stack of 8051. [10]

4. Develop an 8051 ALP to transfer a data from code space starting at address 150H to RAM locations starting at 50H. After transferring the data to RAM, calculate the sum of all data, store the result in RAM location starting at 65H and show the status of PSW register. The data is as shown below: [10]

ORG 150H

DB 04H, 26H, 59H, 20H, 34H, 55H

5.(a) Assume that XTAL = 11.0592 MHz. What value do we need to load the timer's register if we want to have a time delay of 5 ms (milliseconds)? Show the program for timer 0 to create a pulse width of 5 ms on P2.3. [10]

OR

5.(b) Develop an assembly code using 8051 to count external pulses at T0 and if the count is equal to 200d then generate a square waveform of 25ms(Ton=Toff) at P0.0. Assume crystal frequency of 16MHz. [10]

6. Write a program to receive data until the received data is "N", means if 8051 receives "N" then it should stop receiving the character. Baud rate of 9600. [10]

7.(a) Develop an ALP using 8051 Microcontroller to receive the character at 9600 baud rate and transmit the same received character at 4800 baud rate Use interrupt. [10]

OR

7.(b) Assume a push button [PB] is interfaced to pin INT0. [10]

Monitor its status and set the baud rate as follows:

If PB = 0, transmit "V" at 4800 baud rate continuously

If PB = 1, transmit "I" at 4800 baud rate only once

Assume XTAL = 11.0592 MHz. USE interrupt.

8. Assume a sensor is interfaced to INT1. The role of sensor is to measure the number of rotation of MOTOR1. Sensor will generate a high to Low pulse whenever MOTOR1 completes 1 rotation. MOTOR1 is interfaced to p2.1. MOTOR2 is interfaced to p2.0. When the sensor detects that MOTOR1 completed 200 rotations, STOP the MOTOR1 by sending 0 to p2.1 and Start the MOTOR2 by sending 1 to p2.0. Write an assembly language program for the above application. [10]

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[10]

9. Write an 8051 assembly program for the below LCD display [2rows, 16 characters]. Assume "VITloE" is stored in ROM starting from 100H. Bring the characters that to be displayed in LCD from ROM location starting at 100H as per the following [10]

-	-	-	-	V	I	T									
							l	o	E						

Reference:

01 – Clear display

38 – 2 lines 5X7 matrix

0E – Display ON cursor blinking

06 – Increment cursor

04 – Decrement cursor

80 – Force cursor to beginning of first line.

C0 - Force cursor to beginning of Second line

10. Draw and explain interfacing of 4 x 4 matrix keypad with 8051 microcontroller. Write program to read switch. [10]

11. List the features of RISC and CISC architectures. [5]

