Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
END TERM EXAMINATION - JUN 2023

Semester : Semester IV - 2021
Course Code : EEE2005
Course Name : Sem IV - EEE2005 - Microprocessor and Microcontrollers
Program : EEE

Date : 14-JUN-2023
Time : 9.30AM - 12.30PM
Max Marks : 100
Weightage : 50%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **(10 X 3 = 30M)**

1. Describe the function of following opcodes; a. JZ, b. JNZ, c. DJNZ Rn, radd
(CO3) [Knowledge]

2. Define addressing mode and list the various types of addressing modes
(CO2) [Knowledge]

3. Define the term Interrupt and Polling of 8051 microcontroller
(CO5) [Knowledge]

4. List out the difference between the Microprocessor and the Microcontroller.
(CO1) [Knowledge]

5. Describe the CALL and RETUN instruction of 8051 microcontroller with necessary examples
(CO3) [Knowledge]

6. List out the important characteristics of an embedded system.
(CO1) [Knowledge]

7. Tabulate the following interrupt vector ROM memory location's; a. Reset, b. External HW (INT0), c. External HW (INT1).
(CO5) [Knowledge]

8. Define instruction set and list out the various types of Instruction sets
(CO2) [Knowledge]

9. Find the timers clock frequency and its period for various 8051 based system, with the following crystal frequencies;
a. 22 Mhz
b. 11.0592 Mhz
(CO4) [Knowledge]

10. Identify which mode and which timers are selected for each of the following;
MOV TMOD, #01H
MOV TMOD, #20H

(CO4) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **(3 X 10 = 30M)**

11. An embedded system is a collection of computer software and hardware that can be permanent or customizable. An embedded system can be a stand-alone system or a component of a bigger system. It is primarily intended to perform a particular purpose or functions within a larger system. Discuss the execution of an embedded system using the required block diagram and determine the various benefits of embedded systems. Identify some of the possible embedded system uses in real-world applications.

(CO1) [Comprehension]

12. The operands of the instructions may be kept in RAM or in the registers of the central processor unit. If the argument is placed into main memory, the operand field of the instruction will contain a reference to that address. The argument's location can be stated in a number of methods. The different methods in which the command defines the location of the operand are referred to as addressing choices. Discuss the different methods of accessing the material using appropriate examples.

(CO2) [Comprehension]

13. The Atmel AT89C1051 microcontroller chip is being used in a development team's final product. There are just 1K bytes of flash ROM on this chip. Is it better to use the LCALL or ACALL instruction when writing code for this chip? To make port 1's bits toggle, you need to programme an ALP to continuously deliver the values 55H and AA H to it. Adjust the timeout for Port 1 data transmissions.

(CO3) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS **(2 X 20 = 40M)**

14. a. Analog to digital converters are among the most widely used devices for data acquisition. Digital computers use binary values, but in the physical world everything is analong (continuous). Temperature, pressure (wind or liquid), humidity, and velocity are a few examples of physical quantities that we deal with every day. A physical quantity is converted into electrical quantity (voltage, current) signals using a device called a transducer. The transducers are also referred to as "sensors." Therefore, we need an analog to digital converter to translate the analog signals to digital numbers so that the microcontroller can read and process them. Identify and describe the function of each pin of the suitable IC that is used to convert the analogue signal to a digital signal with the necessary diagram.
b. Construct the ADC0804 connection to the 8051, and then an assembly language programme monitors the INTR pin and brings an analog input into register A. It then calls Hex-to-ASCII conversion and data display subroutines.

(CO5) [Application]

15. Briefly describe the procedure involved in selecting the Timer 0 Mode 1 programming model. By making use of the procedure, compute the value that needs to be loaded into the timer to generate a 5-ms square waveform. Assume that XTAL is 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 programme for timer 0 to create a pulse width of 5 ms on P2.3 and write an assembly language programme to generate a square waveform.

(CO4) [Application]