| PRN: | | Course Code: | UEC404 |
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Second Year **B. Tech** Semester End Examination Winter 2024

# Microcontrollers

000198

Day and Date: Wed 27 NOV 2024 Max Marks: **100**

Time : 02:00PM To 05:00PM Duration: **03** hrs

Instructions: i) All questions are compulsory.
ii) Assume data wherever necessary.

| | | | Marks | Bloom's Level | CO |
|---|---|---|---|---|---|
| Q.1 | | **Attempt the following** | | | |
| | a) | Explain the following 8051 instructions with example<br>1. RL A 2. MOVC A, @A+PC<br>3. MOV @R0, A 4. DAA | 08 | L3 | CO2 |
| | b) | Elaborate the PSW SFR of 8051. | 08 | L4 | CO1 |
| | | OR | | | |
| | b) | Comment on the RAM memory organization in 8051 | 08 | L4 | CO1 |
| Q.2 | | **Attempt the following** | | | |
| | a) | Explain the working of timer 1 in 8051 with a neat diagram. | 08 | L3 | CO3 |
| | b) | Comment on every bit of IE SFR in 8051 | 08 | L2 | CO1 |
| | | OR | | | |
| | b) | Demonstrate the use of every bit in SCON SFR of 8051. | 08 | L2 | CO1 |
| Q.3 | | **Attempt any two from the following** | | | |
| | a) | Interface 8 LEDs to port 1 of 8051 and write an assembly or C program to implement running LED program on it. | 08 | L4 | CO2 |
| | b) | Elaborate the interfacing of LCD with 8051 and write a program to display "8051" on it. | 08 | L4 | CO2 |
| | c) | Interface 4KB ROM with 8051 with starting address as 0000H also find the final address. | 08 | L4 | CO3 |
| Q.4 | | **Attempt any two from the following** | | | |
| | a) | Comment on the concept of pipeline in PIC16F877. | 08 | L5 | CO3 |
| | b) | Explain the following instructions of PIC16F877 with example<br>1. INCFSZ 2. MOVWF<br>3. BTFSS 4. RETFIE | 08 | L5 | CO3 |
| | c) | Develop an assembly program for PIC16F877 to clear 5 successive locations starting from 70H. | 08 | L5 | CO3 |
| Q.5 | | **Attempt any Two of the following** | | | |
| | a) | Explain the use of every block of timer 0 in PIC16F877 | 09 | L2 | CO3 |
| | b) | Elaborate the ADC module in PIC 16F877 with the help of block diagram | 09 | L2 | CO2 |
| | c) | With the help of block diagram, analyze the capture mode of PIC 16F877 | 09 | L2 | CO2 |
| Q.6 | | **Attempt any Two of the following** | | | |
| | a) | Write an embedded C program for PIC 16F877 to generate a square wave of 4KHz on any pin of PORTD. Assume crystal frequency of 12 MHz | 09 | L3 | CO4 |
| | b) | Write an embedded C program for PIC 16F877 to rotate the stepper motor by 270° and then stop. Assume the step angle of motor as 6°. | 09 | L3 | CO4 |
| | c) | Write an embedded C program for PIC 16F877 to turn ON the relay connected to pin RE0 for 2 seconds when the key connected to pin RB0 is pressed. | 09 | L3 | CO4 |

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Backlog