PUNJAB ENGINEERING COLLEGE, CHANDIGARH

(Deemed to be University)

End-Term Examination, (July-November 2020)

Programme: B.Tech. (ECE) **Year:** 3rd /5th Semester
Course Name: Embedded Systems **Course Code:** ECN - 305
Maximum Marks: 55 **Time allowed:** 02 Hours

Notes:

- All questions are compulsory.
- The candidates, before starting to write the solutions, should please check the question paper for any discrepancy, and also ensure that they have been delivered the question paper of right course code.
- Unless stated otherwise, the symbols have their usual meaning in context with subject. Assume suitably and state, additional data required if any.
- Attempt all questions in sequence order given in the question paper.

S.No.	Questions	Marks
1.	a.) Compare the following: 1. Microprocessor and Microcontroller 2. Von-Neumann and Harvard Architecture b.) What are assembler directives? Discuss with examples.	 02 02 01
2.	a.) Discuss RAM memory space allocation in 8051? b.) Write a program for 8051 to perform the following (Xtal = 22MHz): i. Keep monitoring the P1.4 bit until it becomes low ii. When P1.4 becomes low, write value 35H to port 2 iii. After waiting for 50ms, send a high-to-low (H-to-L) pulse to P0.3	02 03
3.	a.) Define resolution of an ADC. For a 10-bit ADC with 5V input, calculate the step size and determine the output voltage. b.) Assume that register A has packed BCD 19, write a program to convert packed BCD to two ASCII numbers and place them in R3 and R4.	03 02
4.	a.) Differentiate between interrupt and polling. WAP that generates a square wave of 10 KHz with timer 0 in mode 2 at port pin P1.2 and displays 'A' at Port 2 and 'G' at Port 0. (Xtal = 22MHz) b.) What is a subroutine? Write a subroutine which checks the content of 20H. If it is a positive number, the subroutine find its two's complement and store it in same location and returns.	03 02
5.	Interface an LCD display to 8051 and WAP to display the message 'SOCIAL DISTANCING'.	05

6.	a.) Write a C18 program with Timer0 and Timer1 interrupts to generate square wave on pin RB1 and RB7, while data is being transferred from PORT C to Port D. b.) Explain the features of RISC architecture in detail. Give two factors that can affect the time delay code size in the PIC18 microcontroller.	03 02
7.	a.) Write a C18 program for PIC microcontroller to monitor bit PC5. If it is high, send 55H to Port B otherwise, send AAH to Port D. b.) Write a C18 program for PIC microcontroller to generate a frequency of 250Hz on all the bits of PORTC. Use timer0, 16-bit mode and no prescalar to create the frequency. (Assume XTAL frequency = 10MHz). c.) A switch is connected to pin PORTB.7. Write a C18 program to monitor SW and create the following frequencies on the pin PORTB.0. SW=0; 250Hz SW=1; 500Hz Use timer0 for both of them	02 03 05
8.	a.) Explain in detail with diagram about the memory organization of PIC microcontroller? b.) What are the different source of interrupt available in PIC18 microcontroller? Also write the steps to enable the interrupt with a proper diagram? c.) What is the use of TCON register? Also explain in detail the function of its bits. d.) What are the main difference between flash memory and EEPROM memory	2.5 2.5 03 02
9.	a.) How serial port devices communicate with each other? Explain with handshake signals. b.) Write an assembly language program to receive the data which has been sent in serial form at baud rate 9600bps and send it out to port 0 in parallel form. Also save the data at RAM location 300H. (Assume XTAL = 11.0592Mhz). c.) Discuss the role of timer 3 and it's control register in PIC. Also discuss the use of T3CON in the CCP module.	01 03 01