Name: **Enrolment No:**	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2020

Programme Name: B. Tech ASE+AVE **Semester : V**

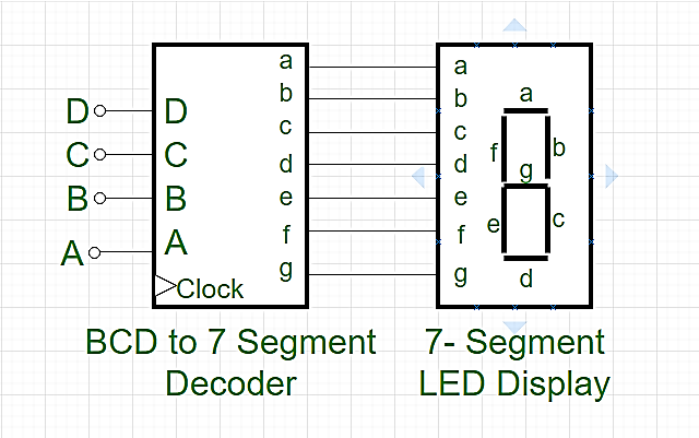
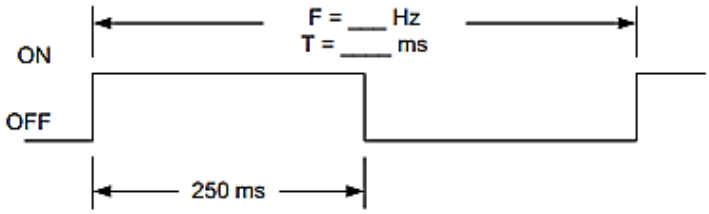
Course Name : Embedded System

Course Code : ECEG 3039 **Max. Marks: 100**

Instructions: The Question paper has three sections such as Section A, B and C Section. Section A (Type the Answer) Section (B & C) – Scan and upload. Make use of *sketches/plots (Part B & Part C Section)* to elaborate your answer. Brief and to the point, answers are expected.

SECTION A (6*5 =30 Marks)

S. No.	Questions	Marks	CO
Q 1	Describe the function of the following pins of 8051 microcontroller **i) PSEN** ii) **RST** iii) **INT0** iv) **T0** v) **ALE**	**5**	**CO2**
Q 2	Write the differences between embedded system and general computing systems along with applications.	**5**	**CO1**
Q 3	Explain the memory devices in embedded system	**5**	**CO2**
Q 4	List out the limitations/drawbacks of assembly language based embedded firmware development.	**5**	**CO3**
Q 5	State the features of **ZigBee** wireless communication with network charactertics.	**5**	**CO4**
Q 6	What is the difference between synchronous/Serial and asynchronous/parallel data transmission?	**5**	**CO4**

SECTION B (5*10 =50 Marks)			
Q 7	Implement the **BCD** to seven segment decoder has four input lines (A, B, C and D) and 7 output lines (a, b, c, d, e, f and g), this output is given to seven segment **LED** display with common anode configuration.  a) Draw a circuit diagram for common anode configuration b) Display the decimal number depending upon inputs.	**10**	**CO2**
Q 8	a) What is the frequency, period, and duty cycle of the following waveform  b) Discuss about the architecture of **8086** Microprocessor – Register, Memory, I/O, Timing and control units.	**10**	**CO1**
Q 9	What is Hamming code? Assume that the code word is (0011001) is transmitted and that 0010001 is received. The receiver does not "know" what was transmitted and must look for proper parities to determine if the code is correct. Designate any error that has occurred in transmission if even parity is used.	**10**	**CO3**

Q 10	Explain the types of sensors used in embedded systems. a) Gopal position sensor (**GPS**) b) 9 **DOF** (Gyros/Accelerometer) c) Servo motor	**10**	**CO4**
Q 11	Write short notes on serial communication protocols a) **UART/USART** b) **I^2C** c) **SPI** d) **PWM** e) **Bluetooth/ IEEE 802.15.3**	**10**	**CO4**
SECTION-C (1*20 = 20 Marks)			
Q 12	a) Design a diagram to interface a DC motor to Arduino and write a program in embedded C to rotate motor in clockwise direction. DC Motor voltage level is 5V reference value. Discuss the **L293D** driver IC PIN diagram. b) Design the interfacing diagram of **16x2 LCD** display with Arduino and write a program in embedded C to display first row "Welcome Back" second row "To" after 2 sec delay first row "Engineering" second row "online" and state the function of i) **RS** ii) **EN** iii) **R/W** .	**20**	**CO3**