Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, Dec 2021

Course: Embedded System **Semester: V**
Program: B.Tech Mechatronics Engg. **Time: 03 hrs.**
Course Code: ECEG-2003 **Max. Marks: 100**

SECTION A (5*4)
All questions are compulsory in Section A

S. No.		Marks	CO
Q 1	Write down the differences between OS and RTOS.	**4**	**CO2**
Q 2	Illustrate the followings for 8085 processor with examples? (a) Priority based interrupt (b) Maskable and non-Maskable interrupts	**4**	**CO1**
Q 3	Discuss about task and task states in Real time operating systems with diagram.	**4**	**CO2**
Q 4	Write down a program for LED blinking for 8051 microcontroller using embedded C/ Assembly language.	**4**	**CO1**
Q 5	Define embedded system and describe their classifications. Also, discuss the future trends in embedded system.	**4**	**CO4**
	SECTION B (4*10) **Choice in Question 8**		
Q 6	Define the term Encoding and flow control. Also, briefly explain the objective of control hierarchy and the steps involved in hierarchy.	**10**	**CO4**
Q 7	Explain the concept of Ideal top-down design process and productivity improvers with the help of diagram.	**10**	**CO5**
Q 8	Define resolution and the full scale output? A 10-bit DAC has a step size of 10 mV. Determine the full-scale output voltage and the percentage resolution. Or Draw the interfacing circuit of seven segment display unit with 8051 microcontroller. Also, write down a program for the same using embedded C/Assembly language.	**10**	**CO3**
Q 9	Assume the following values for the ADC clock frequency = 1 MHz; V_T = 0.1 mV; DAC has F.S. output = 10.23 V and a 10-bit input. Determine the following values. a. The digital equivalent obtained for V_A = 3.728 V. b. The conversion time. c. The resolution of this converter.	**10**	**CO3**
	SECTION-C (2*20) **Attempt any two questions**		
Q 10	a) Draw and explain working of R/2R Ladder DAC. Also, write down the various DAC Specifications. b) Explain the term scheduling and different types of scheduling algorithm in RTOS.	**10+10**	**CO5**
Q 11	a) Write down the various Communication Strategies for Embedded Systems and explain I2C communication interference.	**10+10**	**CO4**

	b) Draw and explain pin diagram of 8051.		
Q 12	a) Detail the completed internal RAM memory architecture of 8051 with complete description of register banks, bit Addressable RAM allocation and SFR. b) "Embedded system designer optimizes numerous design metric", analyze and suggest, what are the key parameters has taken in defining the optimal design metric.	**10+10**	**CO3**