Name: Enrolment No:	UPES

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

Course: Embedded Systems **Semester: I**
Program: M. Tech A&RE **Time 03 hrs.**
Course Code: ECEG7003 **Max. Marks: 100**
Instructions: Read all the questions carefully. Assume any missing data.

SECTION A			
S.No.	**Answer All the questions**	**Marks**	**CO**
1	In brief, explain the advantages and disadvantages of hardware/software co-design process in embedded systems	**5**	**CO3**
2	In ATmega8, list the different types of memories available along with the size and use of each	**5**	**CO1**
3	In ARM, define pipelining and explain the difference between 3-stage and 5-stage piplelining	**5**	**CO4**
4	In LPC2148, highlight the differences between the thumb and Jazelle mode of operation in detail	**5**	**CO1**
5	Elucidate the differences between pull-up and pull-down resistors for the operation of microcontrollers.	**5**	**CO4**
6	What is the role of CGRAM, DDRAM memories of LCD?? Out of the two which register is programmable by the user??	**5**	**CO2**
SECTION B			
S.No	**Answer all the questions**	**Marks**	**CO**
7	In ARM with an example for each for both hexadecimal and binary data, explain the working of i) PINSEL Register ii) IODIR Register iii) IOSET Register iv) IOCLR register	**10**	**CO1**
8	Considering the electronic equipment's required for a smart home, classify them into different types of embedded systems. With respect to manufacturing, power and energy cost, enlist the devices in ascending order.	**10**	**CO2**
9	Interface and LCD to LPC2148 to display your name in first row and your SAP ID in second row. Write the complete algorithm and code. Draw the necessary flowchart required	**10**	**CO3**
10	In AVR what are the different system clock options available to provide the clock source? Draw the complete block diagram and mention the function of each block	**10**	**CO4**

11	Into how many modes and LPC2148 can be operated? Explain the function of each mode along with the registers required for each mode.	**10**	**CO2**
SECTION-C			
S.No	**Answer all the questions**	**Marks**	**CO**
12	Consider an LCD, 8 LEDs, DC motor to be interfaced with AVR/Arduino. The motor should be rotated in clockwise and anti-clockwise direction. The direction of rotation has to be displayed on LCD and LEDs. Write the complete algorithm and code required along with the schematic/block diagram and flowchart	**20**	**CO3**