Enrolment No:	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, July 2020

Program Name: B. Tech EL **Semester: VI**
Course Name: Microprocessor and Microcontroller **Submission Date**
Course Code: ECEG 3013 **Max. Marks: 100**

Nos. of page(s): 2

Instructions:

1. **Attempt all the questions (Theory, Numerical, Case study etc.) on A4 size blank sheets.**
2. **Attempt all questions serially as per question paper.**
3. **Answer should be neat and clean. Draw a free hand sketch for circuits/tables/schematics wherever required.**
4. **Scan the whole answer script and check the resolution carefully before upload on the blackboard. Note that answer scripts will be considered for evaluation only through Blackboard. No other mode of submission is acceptable.**
5. **You are expected to be honest about each attempt which you make to progress in life**

SECTION A [Case Based Study/design] 40 Marks

S. No.		Marks	CO
Q 1	Design a BCD counter for 8085 processor that should start counting from 0. Once the count reaches its maximum value the counter should reset itself and start the counting again from 0. A delay of one second is a must between the counts. Use register pair HL to load the count. Assume clock frequency of 1kHZ. Also show the calculations of count?	**20**	**CO3 CO2**
Q 2	Using 8051 microcontroller, design a notice board system that can display the message "ELECTRICAL" in the first line and "UPES" in the second line of LCD with the following assumptions a. Connect Port 1 of 8051 to control pins of LCD b. Connect Port 3 of 8051 to data pins of LCD Write the C program along with algorithm.	**20**	**CO3 CO1**

NOTE : The submission time of the Question Paper Answer Sheet is 24 Hhrs from the scheduled time (*exceptional provision due to extraordinary circumstance due to COVID-19 and due to internet connectivity issues in the far-flung areas*).
No Submission will be entertained after 24 Hrs

Q 4	Two numbers 85H and 06H are at 2401 H and 2402 H memory locations and their results are stored in 2503H and 2504 H. Write the ALPs for 8085 microprocessor/8051 microprocessor to support the multiplication and division operation of ALU. Also draw the flowchart and verify your answers.	**10**	**CO2**
Q5	Explain the following flags of 8086 with their use Direction ii) Interrupt iii) Auxiliary Carry iv) Overflow v) Trap	**10**	**CO1**
Q 6	Draw the timing diagram of instruction LDA 4000H. Consider that number F4 is stored in register A. Explain the process happening in each T state of every machine cycle?	**10**	**CO2**
Q 7	a. Draw the architecture of 8051 microcontroller and explain the function of each block. Comment on why and when crystal oscillator should be connected externally. b. Write 8085 assembly language program to subtract two 8-bit numbers C9H and 97H using only two instructions. Mention the result and status of flags.	**10**	**CO1**
Q 8	What is the purpose and use of flag registers in 8085 processor and 8051 controllers? Explain with an example?	**10**	**CO1**
Q 9	a. Comment on the priority of interrupts. Differentiate between hardware and software interrupts, maskable and non-maskable interrupts of 8085 processor? b. Generate 20-bit physical address if i) CS:IP = 2500H:5410H ii) CS:IP = 1800H:0505H.	**10**	**CO2**

NOTE : The submission time of the Question Paper Answer Sheet is 24 Hhrs from the scheduled time (*exceptional provision due to extraordinary circumstance due to COVID-19 and due to internet connectivity issues in the far-flung areas*).

No Submission will be entertained after 24 Hrs

NOTE : The submission time of the Question Paper Answer Sheet is 24 Hhrs from the scheduled time (*exceptional provision due to extraordinary circumstance due to COVID-19 and due to internet connectivity issues in the far-flung areas*).

No Submission will be entertained after 24 Hrs