

Name:
Enrolment No:



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

Course: Advanced Microcontroller for Auto Systems
Program: B. Tech ADE
Course Code: ADEG434

Semester: VII
Time 03 hrs.
Max. Marks: 100

Instructions: Read all the questions carefully. Assume in any missing data.

SECTION A

S.No.	Answer All the questions	Marks	CO
1	In LCD, mention the reason behind using edge triggering for E flag/pin. Explain the use of RS flag/pin along with E flag/pin.	5	CO3
2	Why the GPIO pins of microcontrollers should be internally pulled-up? List the consequences of using external pull-up resistors and not using any pull-up resistors.	5	CO1
3	What is the difference between multi-threaded programming (using semaphores) and pipelining?	5	CO4
4	While using external oscillator for microcontrollers, justify why only crystal oscillator is used? Mention the advantages and disadvantages of crystal oscillator and mention the alternatives to crystal oscillator, if any.	5	CO1
5	In RTOS, what is the importance of real-time execution? Explain with an example.	5	CO4
6	What is the logical difference between common anode and common cathode seven segments? Which type consumes more power and is more costly?	5	CO2

SECTION B

S.No	Answer all the questions	Marks	CO
7	By considering real-time examples present at your home, explain the characteristics of embedded systems.	10	CO1
8	In ARM microcontroller, what is the significance of barrel shifter? Explain with an example.	10	CO2
9	In LPC2148, i) What is use of PINSEL register? Show its configuration for the use of TXD and RXD ii) Can an IOSET register be directly used without using IODIR register? If yes, explain how and if no explain why	10	CO3
10	Using tinkercad and Arduino IDE, Write a C code to display your roll number on first row of a 16x2 LCD and SAP ID in the second row. Mention the steps of algorithm used and draw the flow chart. Draw the schematic and share the link of tinkercad circuit in the solution. Tinkercad link to be mailed separately	10	CO4
11	By considering home automation system, explain a typical co-design process in embedded systems	10	CO2

SECTION-C

S.No	Answer all the questions	Marks	CO
12	Using tinkercad, Arduino IDE, LCD and L293D, interface DC motor with Arduino to rotate in clockwise and ant-clockwise direction. The direction of rotation should be displayed on LCD. Implement the complete set-up and mention the steps of algorithm and draw the flowchart. Tinkercad link to be mailed separately	20	CO3