


Name: Enrolment No:			
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES End Semester Examination, May 2023			
Course: PLC & SCADA Program: M Tech (ARE) Course Code: ECEG 7031		Semester: 2 nd Time : 03 hrs. Max. Marks: 100	
Instructions: Assume suitable data as per the subject.			
SECTION A (5Qx4M=20Marks)			
S. No.		Marks	CO
Q 1	What makes it necessary to use I/O modules while using a PLC?	4	CO3
Q 2	Fill in the blanks: a) RTU stands for _____ and MTU stands for _____. b) In PLC the programming is done in _____. c) PID stands for _____. d) AM stands for _____ which is a form of _____. e) An example of Intelligent field devices is _____.	4	CO1
Q 3	Is there any significant difference between a microprocessor and a PLC?	4	CO4
Q 4	To transmit information over long distance modulation is used. Is the statement true? Justify the statement.	4	CO2
Q 5	Explain in brief various threats to SCADA system.	4	CO5
SECTION B (4Qx10M= 40 Marks)			
Q 6	How are switches (or relays) implemented in a PLC? Explain the use of “NO” and “NC” switches with help of an example. Or Draw a ladder logic diagram to realize operation of a traffic light as follows: a. Red light glows for 60 Sec. b. Orange light glows for 5 Sec. c. Green light glows for 25 Sec. And thereafter the operation continues.	10	CO3

Q 7	Differentiate between sensors and transducers? Name two sensors and two transducers to measure each of the following physical quantities: f) Temperature g) Pressure h) Liquid level i) Flow	10	CO1
Q 8	Draw architecture of SCADA system.	10	CO5
Q 9	Explain the principle of Analog Modulation with the help of a block diagram.	10	CO2
SECTION-C (2Qx20M=40 Marks)			
Q 10	A motor will be controlled by two switches. The <i>Go</i> switch will start the motor and the <i>Stop</i> switch will stop it. When the motor is active a <i>light</i> should be turned on. The <i>Stop</i> switch will be wired as normally closed. The motor should run for at least 10 sec. if the <i>stop</i> switch is pressed for one second, but if <i>stop</i> switch is pressed for 3 sec. the motor should stop immediately. To indicate the duration of the <i>stop</i> switch LED is used. If the <i>stop</i> switch is pressed for 3 sec. to start the motor again, the <i>Go</i> switch must be pressed for 10 sec. Draw a ladder logic program to simulate the operation. Or Design the following logic circuit and draw the truth tables: a. JK Flip Flop by Using SR Flip Flop Constructed from NOR Latch b. JK Flip Flop by Using SR Flip Flop Constructed from NAND Latch c. D Flip Flop d. T Flip Flop	20	CO4
Q 11	Explain the operational and economic benefits of SCADA system in brief. Also list various impacts of SCADA failure.	20	CO5