UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2019

Course: Sensor Technology and Instrumentation **Semester: 4th**
Program: B.Tech CSE+ IoT&SC **Time 03 hrs.**
Course Code: ECEG 2017 **Max. Marks: 100**

Instructions:

SECTION A

S. No.		Marks	CO
Q 1	Illustrate the fundamental components of a chemical sensor along with two applications of using chemical sensors.	4	CO1
Q 2	Infer the basic concepts behind working of Hall Effect sensors and list few of the parameters that can be sensed using these sensors.	4	CO2
Q 3	Examine the working of bi-metallic thermostat describing its effectiveness.	4	CO2
Q 4	Demonstrate the working of IR sensor as people counter. Justify the reason for its great popularity in spite of lesser accuracy.	4	CO1
Q 5	Discover the application of wheat stone bridge to find the value of an unknown resistor.	4	CO2

SECTION B

Q 6	Classify and discuss the various types of measuring pressure and the respective sensors that are used to measure pressure of each category. OR Identify the use of strain gauge with wheat stone bridge for measuring force in different combinations.	10	CO3

Q 7	Discuss and assess following effects in context of sensing some property:
	  a. Photoelectric Effect
	  b. Piezoelectric Effect
		10	CO1

Q 8	Compare transistor as an amplifier in CB and CE configuration along with their characteristics.	10	CO3

Q 9	Illustrate following laws to relate magnetic field with electric voltage:
	  a. Faraday Law
	  b. Lorentz Law
		10	CO2

SECTION-C

Q 10	Generalize the SCADA concept and compare its architecture in different improved generations.	20	CO4
Q 11	Examine actuator as a reverse of sensor and assess its different categories classified on the basis of type of motion provided. OR	20	CO5

Demonstrate the working of DC Motor, Solenoid and AC motor in detail.

Name:

Enrolment No:

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SECTION A			
S. No.		Marks	CO
Q 1	Explain the basic architecture of a chemical sensor. State two factors of improvement on which future research might focus.	4	CO1
Q 2	List and discuss various sensors whose working is derived from the fundamental concept of hall effect.	4	CO2
Q 3	Tabulate the limitations and advantages of each type of bi-metallic thermostat sensor.	4	CO2
Q 4	Identify the use of motion detector for counting people. Justify your answer by giving an example.	4	CO1
Q 5	Assess the use of wheat stone bridge in balanced and unbalanced condition.	4	CO2
SECTION B			
Q 6	Classify and discuss the various types of measuring forces and the respective sensors that are used to measure pressure of each category. OR Identify the use of strain gauge with wheat stone bridge for measuring pressure in different combinations.	10	CO3

Q 7	Discuss and assess following effects in context of sensing some property:
	    a. Hall Effect
	    b. Inverse Piezoelectric Effect
		10	CO1

Q 8	Compare transistor as an amplifier in CC and CB configuration along with their characteristics.	10	CO3
Q 9	State the two laws of magnetism that are building blocks for sensing magnetic field.	10	CO2
SECTION-C			
Q 10	Generalize the SCADA concept and compare its architecture in different improved generations.	20	CO4
Q 11	How actuators differ in their fundamentals from sensors? Classify and discuss the actuators that provides linear, rotation, discrete and continuous motions respectively. OR Demonstrate the working concept of Voice Coil, linear Solenoid and AC motor in	20	CO5

	detail.		