

Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Course: IST for Civil Eng Applications
Program: B.Tech Civil (Infra Dev)
Course Code: ECEG 3042

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

Instructions:

SECTION A
(5Qx4M=20Marks)

Q. No.	Question	Marks	CO
Q 1	List any 4 static characteristics of instruments.	4	CO1
Q 2	A thermocouple is calibrated 100°C to 250°C. The accuracy is specified within ± 0.75 . Calculate the maximum static error?	4	CO2
Q 3	Distinguish between: a) Accuracy and precision b) Repeatability and reproducibility	2+2	CO2
Q 4	Calibration of a bimetallic thermometer gave the following data. Determine the maximum hysteresis error as % of full scale range. Increasing input: Standard °C: 0.0 10.0 20.0 30.0 40.0 Bimetallic thermometer °C: 0.0 10.0 19.9 29.9 40.0 Decreasing input: Standard °C: 40.0 30.0 20.0 10.0 0.0 Bimetallic thermometer °C: 40.0 30.0 20.1 10.1 0.0	4	CO3
Q 5	It is required to measure the temperature of a furnace interior, which temperature measuring instrument is best suited for this purpose? Justify your answer.	4	CO2

SECTION B
(4Qx10M= 40 Marks)

Q 6	For the below set of data, calculate the mean, median, mode, standard dev and variance. 34,45,67,34,55,88,45,34,24,87,67,78,90,65,33	10	CO3
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Q 7	Briefly describe the optical method of measurement of humidity with the help of a diagram. OR Explain the principle of operation of the electrolytic hygrometer with the help of a diagram.	10	CO1
Q 8	What is pH? With the help of a diagram explain the principle of measurement of pH.	10	CO1
Q 9	It is required to install a level indicator system in a wastewater tank containing wastewater having a lot of suspended solids. Choose an appropriate level sensor. Mention the complete principle of operation of the chosen sensor with the help of a diagram.	10	CO3
SECTION-C (2Qx20M=40 Marks)			
Q 10	Distinguish between thermocouples and RTDs based on the construction, principle of operation, accuracy, range, sensitivity, advantages, applications OR Distinguish between pyrometers and resistance temperature sensors based on the construction, principle of operation, accuracy, range, sensitivity, advantages, applications	20	CO1,C O2
Q 11	Derive an expression for the gauge factor of a resistive strain gauge. (10 M) Mention the applications, advantages and disadvantages of resistive strain gauges. (8 M). Assuming that the strain gauges installed in a building are giving erroneous readings due to changes in ambient temperature, what would you do? (2M)	20	CO3,C O4