Name: **Enrolment No:**	

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

Course: Measurement and Instrumentation
Semester: III
Program: B. Tech (RSEE) **Time : 03 hrs.**
Course Code: EPEG2020 **Max. Marks: 100**

Instructions: Write the answer to the point and with clear handwriting.

SECTION A
(5Qx4M=20Marks)

S. No.	All question needs to Answer.	**Marks**	**CO**
Q 1	Classify the different errors of measurements.	**4**	**CO1**
Q 2	A circuit was tuned for resonance by eight different students and the values of resonant frequency in KHz were recorded as 532, 548, 543, 535, 546, 531, 543, and 536. Calculate (a) Mean (b) Average Deviation.	**4**	**CO2**
Q 3	What is creeping in energy meter? How is it prevented?	**4**	**CO 3**
Q 4	A moving coil ammeter has a full-scale deflection of 50 μ Amp and a coil resistance of 1000 Ω. What will be the value of the shunt resistance required for the instrument to be converted to read a full scale reading of 1 Amp.	**4**	**CO 4**
Q 5	What is Transducer? Advantages of Piezoelectric transducers are?	**4**	**CO 5**

SECTION B
(4Qx10M= 40 Marks)

Q 1	With the help of a functional block diagram explain the working principle of digital storage oscilloscope mean its advantages over analog CRO.	**10**	**CO5**

Q 2	What is the major consideration for selecting a voltmeter? Explain with example.	**10**	**CO 1**
Q 3	Derive equation and explain Wheatstone Bridge with neat circuit diagram in detail.	**10**	**CO 3**
Q 4	Write a short note on Linear Variable Differential Transducer (LVDT)	**10**	**CO 5**
SECTION-C (2Qx20M=40 Marks)			
Q 1	(a) What is a thermocouple? Advantages of thermocouple. (10M) (b) A PMMC instrument gives a full scale reading of 25 mA when a potential difference across its terminals is 75 mV. Show how it can be used (a) as an ammeter for the range of 0-100 A (b) as a voltmeter for the range of 0-750 V. Also find the multiplying factor of shunt and voltage amplification. (10M)	**20**	**CO5 CO3**
Q 2	A specimen of iron stamping weighing 10 kg and having an area of 16.8 cm2 is tested by an episteme square. Each of the two winding S1 and S2 have 515 turns. A.C. voltage of 50 HZ frequency is given to the primary. The current in the primary is 0.35 A. A voltmeter connected to S2 indicates 250 V. Resistance of S1 and S2 each equal to 40 Ω. Resistance of pressure coil is 80 kΩ. Calculate maximum flux density in the specimen and iron loss/kg if the wattmeter indicates 80 watts? OR Define transducer and displacement with proper sketch. Write classification of transducer in detail. How is transducer used for measurement? Explain with an example. Write advantage and limitation of electrical transducer.	**20**	**CO4 CO5**