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SARDAR PATEL UNIVERSITY
B.Sc. Semester III Examination (CBCS)
Nov – Dec 2013
US03EELE02: Instrumentation
30th November 2013, Saturday
2:30 pm to 4:30 pm

Total Marks: 70

Note: Figures to the right indicate maximum marks.
Assume data wherever necessary.

Q1 **Choose the correct answer.** **[10]**

1 _____ is the Voltmeter Sensititvity.
a) $S=1/V_{fsd}$ b) $S=I/V_{fsd}$ c) $S=V/I_{fsd}$ d) $S=1/I_{fsd}$

2 A Shunt resistor equation is_____
a) RS = I – Im/ImRm b) RS = I – Rm/ImRm
c) RS = Rm – Im/ImRm d) RS =ImRm / I – Im

3 What is the unit of electric charge Q.
a) Volt b) ampere c) Henry d) Coulomb

4 What is the unit of Area?
a) Tesla b) Square cube c) Waber d) Square meter

5 The Smallest Change in the value of i/p variable being measured, that will cause a change in the o/p signal of the instrument is termed as
a) Hysteresis b) Drift c) Threshold d) Resolution

6 Which class of errors mainly covers human mistakes.
a) Systematic error b) Random error c) Dynamic error d) Gross error

7 Repeatability of the instrument with respect to a given fixed input is
a) Accuracy b) Sensitivity c) Resolution d) Precision

8 Zero error of micro meter is
a) Random error b) Interference error
c) loading error d) Systematic error

9 The error which is repetitive in nature is
a) Observational error b) Environmental error
c) Random error d) Systematic error

10 Power Gain in an Amplifier is
a) Current gain/Voltage gain b) Voltage gain/Current gain
c) Input power/Output power d) Current gain x Voltage gain

Q2 **Answer in short [ANY TEN]** **[20]**

1 Draw the functional elements of the digital read out pressure gauge.
2 Write down the full form of PMMC and LVDT.
3 What are the active and passive instruments?
4 Give the definition of Sensitivity, Resolution and Error.
5 What is the difference between Accuracy & Precision?
6 Write down the classification of instruments (any four).
7 Draw the functional elements of the Bourdon tube pressure gauge.
8 The Floor Area of an office building is 5,000m. Calculate the floor area in ft.
9 Draw the table of Electrical & Magnetic Units.
10 Give the definition of Accuracy, Precision.
11 List out typical application areas of instrumentation systems.
12 Discuss Arithmetic mean with one example.

P.T.O.

Q3		Explain Typical application of instrument systems.	**[10]**
		OR	
		Describe Deflection & Null types, manually operated & automatic types instruments.	**[10]**
Q4	A	Explain all types of errors ?	**[05]**
	B	Six determination of current recorded as 12.8mA, 12.2mA, 12.5mA, 13.1mA, 12.9mA and 12.4mA. Calculate (a) the arithmetic mean (b) deviation from the mean (c) the average deviation.	**[05]**
		OR	
	A	Describe Measurements and Errors.	**[05]**
	B	The following values were obtained from the measurements of the value of a resistor: 147.2Ω , 147.4Ω , 147.9Ω , 148.1Ω , 147.1Ω , 147.5Ω ,147.6Ω , 147.4Ω , 147.6Ω and 147.5Ω. Calculate (a) the arithmetic mean (b) deviation from the mean (c) the average deviation.	**[05]**
Q5	A	The Accelerator limit on a four-lane highway is 70mi/hr. Calculate the speed limit in (a) km/hr; (b) ft/s.	**[05]**
	B	Write a note on Conversion of units.	**[05]**
		OR	
	A	The Speed of train is 60 km/hr. calculate the limit in (a) mi/hr; (b) ft/s.	**[05]**
	B	Draw the table of six basic SI quantities and units of measurements, With their unit symbols.	**[05]**
Q6		Explain Torque and Deflection of galvanometer.	**[10]**
		OR	
		Explain Shunt Resistor, Ayrton Shunt and Multiplier Resistor with necessary diagram and equation.	**[10]**

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