Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Winter Examination-2015

Subject Name : Electrical & Electronics Measurement

Subject Code : 4TE04EEMI **Branch :B.Tech. (Electrical)**

Semester : 4 Date : 21/11/2015 Time :2.30 To 5.30 Marks :70

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Attempt the following questions:** **(14)**

a) An 0-10A ammeter has a guaranteed accuracy of 1 % of full scale deflection. The limiting error while reading 2.5 A is: **(01)**
a) 1%, b) 2%, c) 4%, d) none of the above

b) If the confidence level is 0.95, then the value lying outside the confidence interval are: **(01)**
a). 1 in 5, b). 1 in 20, c). 1 in 100, d). 1 in 1000.

c) The base units in SI system are **(01)**
a). metre, kilogramme, second,
b). metre, kilogramme, second, ampere,
c). metre, kilogramme, second, ampere, kelvin, candela, mole,
d). metre, kilogramme, second, ampere, kelvin, candela.

d) The material of wires used for making resistance standards is usually: **(01)**
a). manganin, b). nichrome, c). copper, d) phosphor Bronze.

e) Materials used for precision resistor should have: **(01)**
a). Low resistivity, b). high resistance temperature co-efficient, c). high thermoelectric emf against copper, d). none of the above.

f) Four terminal resistor are used for resistance values: **(01)**
a). greater than 10Ω, b). greater than 1 Ω, c). less then 1 Ω, d). of the order of M Ω

g) A voltage of 200V produces a deflection of 90^{o} in a PMMC spring controlled instrument. If the same instrument is provided with gravity control, what would be the deflection ? **(01)**
a). 90^{o}, b) 45^{o}, c) 64.2^{o}, d) can not be known from the date given.

h) A wheatstone bridge cannot be used for precision measurement because errors are introduced into on account of. **(01)**
a). resistance of connecting leads,
b). thermo-electric emfs,
c). contact resistances,
d). all the above.

i) High resistances are provided with a guard terminal. This guard terminal is used to: **(01)**
a). bypass the leakage current
b). guard the resistance against stray electrostatic fields,
c). guard the resistance against overloads,
d) none of the above.

j) Frequency can be measured by using **(01)**
a). Maxwell's bridge, b). Schering bridge, c). Heaviside Campbell bridge
d). Wien's bridge.

k) Permant magnets are tested by: **(01)**
a). ballistic methods, b). using an electrical circuit having an mutual inductance.
c). potentiometric methods, d) bettering apparatus.

l) Maxwell's inductance capacitance bridge is used for measurement of inductance of: **(01)**
a). Low Q coils, b). Medium Q coils, c). High Q coils, d) Low and medium Q coils.

m) Wien's bridge is primarily knowb as **(01)**
a). a voltage determining bridge, b). a current determining bridge, c). frequency determining bridge, d). none of the above

n) Universal impedance bridge is measuring **(01)**
a). a.c. resistances, b). d.c resistances, c) a.c. and d.c. both resistance,
d) all of the above

Attempt any four questions from Q-2 to Q-8

Q-2 **Attempt all questions** **(14)**

a) Explain the difference between limiting and known errors by citing suitable examples. **(06)**

b) Errors in measurements can be classified **(04)**
a). gross errors, b) systematic errors, c) random errors.

c) Explain Dynamic analysis of measurement systems. **(04)**

Q-3 **Attempt all questions** **(14)**

a) Define the seven base units of SI system. **(07)**

b) Describe the sources and the null detectors that are used for a.c. bridges. **(07)**

Q-4 **Attempt all questions** **(14)**

a) Derive the equations for balance in the case of maxwell's inductance capacitance bridge with help of sketch. **(07)**

b) Explain the function and working of Wagner earth devices with help of sketch. **(07)**

Q-5 **Attempt all questions** **(14)**

a) Explain with help of figure the Kelvin's double bridge Measurement of medium resistance. **(07)**

b) Explain the effect of secondary burden on the ratio and phase errors of current transformer. **(07)**

Q-6		**Attempt all questions**	**(14)**
	a)	Describe the working of a megohm bridge.	**(04)**
	b)	Draw the circuit of kelvin's double bridge used for measurement of low resistance. Derive the condition of balance.	**(07)**
	c)	Explain the testing methods of earth resistance.	**(03)**
Q-7		**Attempt all questions**	**(14)**
	a)	Explain the Wheatstone bridge with need of sketch.	**(05)**
	b)	Describe swept frequency generator with help of sketch.	**(05)**
	c)	Explain the different types of distortions caused amplifier loads.	**(04)**
Q-8		**Attempt all questions**	**(14)**
	a)	Explain the difference between a.c. and d.c. calibrations with help of examples	**(05)**
	b)	Write short note of 1) Moving iron Instruments. 2) Series type Ohmmeter	**(05)**
	c)	Explain the following terms a) SWR b) VSWR	**(04)**