Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2018

Subject Name: Electrical & Electronics Measurement

Subject Code: 4TE04EEM1 **Branch: B.Tech (Electrical)**

Semester: 4 **Date: 03/05/2018** **Time: 10:30 To 01:30** **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) Megger is used to measure_____ (Fill the blank).

b) Cable is generally made up of _____
a) copper b) Aluminum c) wood d) None of the above

c) In an Anderson bridge, the unknown inductance is measured in terms of
a) known inductance and resistance b) known Capacitance and resistance c) known resistance d) none of the above

d) True value of resistance is equal to the measured value only if the resistance of voltmeter is infinite. True or false

e) A moving iron instrument can be used for
(a) D.C. only (b) A.C. only (c) Both A.C. & D.C. (d) None of above

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

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

h) An induction meter can handle current up to____
a) 30 A b) 60 A c)50A d)100A

i) An 0-10 A ammeter has a guaranteed accuracy of 1 percent of full scale deflection. The limiting error while reading 2.5 A is
a)1 % b) 2% c) 4% d) None of the above

j) The use of _____ instruments is merely confined within laboratories as standardizing Instruments.
(a) indicating (b) absolute (c) recording (d) integrating

k) Wattmeter has two coils namely _____
(a) voltage and pressure coil (b) voltage and resistance coil
(c) voltage and current coil (d) pressure and resistance coil

l) Maxwell's inductance-capacitance bridge is used for measurement of inductance of
(a) Low Q coils (b) medium Q coils (c) high Q coils (d) Low& medium Q coils

m) The unit of Ammeter Sensitivity is

a)volt b) ohm c)Volt/ohm d)ohm/volt

n) A 0-300V voltmeter has an error of ± 2 % of full scale deflection. What would be the range of reading if true voltage is 30V?
a)24V-36V b)29.4V -30.6V c)20V -40V d)none of the above

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

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

(a) Explain different types of errors that may occur in measurements.

(b) What are the different methods to measure high resistance? Explain any one in detail.

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

(a) Explain De Sauty's bridge with Phasor diagram.

(b) What are the difficulties associated with the measurement of low resistance? Describe how low resistance is measured accurately by Kelvin's double bridge.

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

(a) Explain Hay's bridge with advantages and disadvantages.

(b) Define the terms: (1) Accuracy (2) Precision (3) Resolution (4) Sensitivity (5) Reproducibility (6) Error (7) Drift

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

(a) Write a short note on spectrum analyzer.

(b) Explain working principle of induction type energy meter.

Q-6 **Attempt all questions** **(14)**

(a) Explain construction & working of Meggar.

(b) Explain construction and working of current transformer with the help of phasor diagram.

Q-7 **Attempt all questions** **(14)**

(a) Explain the principle and operation of Potential Transformer and also discuss the Ratio and Phase angle error.

(b) Write short note on flux meter.

Q-8 **Attempt all questions** **(14)**

(a) A sheet of backellite 4.5 mm thick is tested at 50 Hz, between electrodes 0.12 m in diameter. The Schering bridge employs a standard air capacitor C2 of 100 pF capacitance, a non-inductive resistance of $1000/\pi\ \Omega$ in parallel with a variable resistance R3. Balance is obtained with C4 = 0.5 μF & R3 = 260 Ω. Calculate unknown capacitance, power factor and relative permittivity of sheet.

(b) A CRT has an anode voltage of 2000V and parallel deflecting plates 2 cm long and 5 mm apart. The screen is 30 cm from the centre of the plates. find the input voltage required to deflect the beam through 3 cm.The input voltage is applied to the deflecting plates through amplifiers having an overall gain of 100.