SUBJECT CODE NO:- P-76
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(EEP/EE/EEE) Examination May/June 2017
Electrical Measuring Techniques
(Revised)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
        i) Question No. 1 & Question No.6 are compulsory
        ii) Attempt any two question from remaining question of each section
        iii) Assume the suitable data whenever necessary

Section A

Q.1   Solve any five question   10

i) Differentiate between the terms repeatability and reproducibility

ii) Define the term accuracy and precision

iii) What do you mean by static calibration? Give the steps which are necessary for calibration.

iv) What is main function of the instruments:

i) Indicating function

ii) Recording function

v) A voltmeter reads 112.68 V of the true value of voltage is 112.6 V determine static error and static correction for voltmeter

vi) The measured value of resistance is 12.25Ω where as its value is 10.22Ω Determine the absolute error

vii) What are gross errors? How can these be avoided

viii) What is polyphone wattmeter?

Q.2   a) Explain the Maxwell's inductance capacitance bridge & derive expression   08

b) A bridge is used to measure the properties' of a sample of sheet steel at 2KHZ. A balance a b is test 07
specimen arm b c is $R_3 = 100\ \Omega$, arm cd is $C_4 = 0.1\ \mu F$ and arm da is $R_2 = 834\ \Omega$ in series with capacitor
$C_2 = 0.124 \mu F$ calculate the effective impedance of the specimen under test.

Q.3   a) Explain construction and working of pmmc instrument with figure   08

b) A moving coil instrument has the following data : number of turns = 100 width of coil = 20 mm, depth of 07
coil 30 mm, flux density in the gap is 0.1 w b/m^2 calculate the deflecting torque when carrying current of
10mA . Also calculate deflection if the control spring constant is 2×10^{-6} N-M / degree

Q.4   a) Device the expression for power measurement in 3Ø circuit by 2- wattmeter method for balance Star 08
connected load and draw the phasor diagram

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b) A 3 Ø 440 v motor load has a power factor of 0.76. The two wattmeter connected to measure the power show the input to be 30 kw kind the reading on each instrument   07

Q.5   a) Explain the working & derive expression for measurement of capacitance by Schering bridge & draw the phasor diagram   08

b) State the explain types of errors in wattmeter   07
i) errors due to friction
ii) error due to pressure coil capacitance
iii) error due to stray field

Section B

Q.6   Solve any five question   10
i) What are the applications of CRO?
ii) What are different types of amplifiers used in CRO?
iii) What is meant by ratio error and phase angle error in CTS?
iv) what is meant by turn compensation and why is it done?
v) How does PT differs form a power transformer?
vi) What is transducer? What are functions of transducer in electronic instrumentation system?
vii)A 5A , 230 v meter on full load unity p.t test makes 60 evaluation in 360sec off the normal disc speed is 480 rv / kwh what the percentage error.
viii) what are the error caused due to driving system in 1 Ø energy meter?

Q.7   a) Explain contraction & working of 1 Ø Induction type energy meter and derive the expression for average torque   08

b)A 230 v, 50 HZ, 1 Ø energy meter has a constant of 200 rev / kwhr. While supplying a non-inductive of 5.2A at normal voltage. The meter takes 4 minutes for 10 revolution. Calculate the percentage error of the instrument   07

Q.8   a)What are advantage and disadvantages of capacitive transducers   07

b) Explain the measurement can be made with the use of CRO   08
i) Frequency   ii) phase angle

Q.9   a) what are advantages of instrument transformers over shunt and multiplies?   07

b) List the error and adjustment of error in 1 Ø Induction type energy meter state how to eliminate it   08

Q.10   a) Explain the following in relation to a PT   08
i) Effect of change in secondary burden
ii)effect of change in frequency

b) Explain the working of law power factor watt meter   07

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