Register Number: ……………………..

B.E DEGREE EXAMINATIONS: APRIL/MAY 2014

(Regulation 2009)

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

EEE264: Electrical Measurements and Instruments

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1.   Rectifier type instruments are employed to measure _____.

   a)   ac with higher sensitivity   b)   ac with high accuracy

   c)   dc with higher sensitivity   d)   dc with high accuracy

2.   The purpose of shunts in PMMC and MI instruments is to _____.

   a)   Increase the range of potentiometers   b)   Increase the range of voltmeters

   c)   Increase the range of ammeters   d)   Increase the range of wattmeter

3.   In electrodynamometer type wattmeter the pressure coil is the _____.

   a)   Moving coil   b)   Resistance in series

   c)   Fixed coil   d)   Load resistance

4.   When a normal wattmeter is used in LPF measurement ,the _____.

   a)   Deflecting torque decreases   b)   deflecting torque increases

   c)   Controlling torque increases   d)   controlling torque decreases

5.   Standardization of potentiometer determines

   a)   The working current   b)   Battery voltage

   c)   The slide wire position   d)   All of the above

6.   The burden of current transformers is expressed in terms of

   a)   Secondary winding current   b)   VA rating of transformer

   c)   Voltage ,current and power factor of   d)   None of the above
       secondary winding circuit

7.   Loss of charge method is used for the measurement of resistance of

   a)   Conducting wires   b)   leakage resistance of capacitance

   c)   Resistance of insulating cables   d)   none of the above

8.   Wheatstone bridge is used to measure _____

   a)   Low resistance   b)   Medium Resistance

   c)   High Resistance   d)   High Capacitance

9.   Frequency can be measured using _____.

   a)   Schering bridge   b)   Hay's bridge

   c)   Wein's bridge   d)   Anderson bridge

10.   Hay's bridge is used to measure _____.

   a)   Resistance   b)   Capacitance

   c)   Impedance   d)   Inductance

PART B (10 x 2 = 20 Marks)

11.   Give the applications of electrodynamometer type instruments. Why are they called transfer instruments?

12.   What are the advantages and disadvantages of PMMC and MI instruments?

13.   What is the difference between power and energy? How is power measured?

14.   Define Calibration.

15.   How do you standardize a dc potentiometer?

16.   How error is eliminated in Transformers?

17.   What is the principle behind direct deflection method of resistance measurement?

18.   What is the principle of megger?

19.   Define Q of coil.

20.   List the compensation techniques to eliminate errors in bridges.

PART C (5 x 14 = 70 Marks)

21.   a)   With neat sketch explain the operation of a moving iron instrument and derive an expression for deflection.

(OR)

     b)   Detail on the ways of extending the ranges of a PMMC ammeter and its temperature compensation.

22.   a)   What are the known ways of measuring power ? Prove their disadvantages. Give the construction and working principle of an instrument that substitutes the above measurement

(OR)

b)   Derive the torque expression for induction type energy meter.

23.   a)   A non reactive resistor of 1000 Ω is connected in series with a coil and a capacitor to a 50 Hz supply. If the voltages across each, measured by an ac potentiometer are +0.6-j0.24V ,+0.6+j0.4 V and -0.1-j0.4 V respectively. Find the power dissipated and the mean stored energy in each component.

(OR)

b)   Explain in detail the operation of a coordinate type ac potentiometer

24.   a)   Draw the circuit of a wheatsone bridge and derive the condition for balance.

(OR)

b)   Explain the loss of charge method for the measurement of insulation resistance of cable. A cable tested by loss of charge method using a ballistic galvanometer with the following results. Discharged immediately after electrification, deflection 200 divisions. Discharged after 30s and after electrification .i)deflection 126 div. ii)when in parallel with resistance of 10Mohm,deflection 100 div. calculate the insulation resistance of the cable.

25.   a)   Draw the circuit of Schering bridge and derive the expression. Discuss its relative merits and demerits

(OR)

b)   With neat sketch explain the operation of a vibration galvanometer

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