Register Number: ……

B.E. DEGREE EXAMINATIONS: NOV/DEC 2012

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

EEE264: Electrical Measurements & Instruments

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

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. Horizontally mounted moving iron instruments use:

(a) Eddy current damping (b) electromagnetic damping

(c) Fluid friction damping (d) air friction damping

2. In electrodynamometer type wattmeter, current coils designed for carrying heavy currents use

Stranded wire to reduce:

(a)Iron losses (b) hysteresis losses (c) eddy current losses (d) copper losses

3. When measuring power with an electrodynamometer wattmeter in a circuit where the load current is small:

(a) The current coil should be connected on the load side

(b) The pressure coil should be connected on the load side

(c) The pressure coil should be connected on the supply side

(d) It is immaterial whether the pressure coil or the current coil is on the load side.

4. In the single phase induction meter, in order to obtain true value of energy, the shunt magnetic flux should lag behind the applied voltage by:

(a) 90 degrees (b) 0 degree (c) 45 degrees (d) none of the above

5. Brooks deflection potentiometer is used when the unknown voltage:

(a) Is constant (b) Is varying at a slow rate (c) Is varying very quickly d) All the above

6. The compensation is used in current transformers primarily for reduction of:

(a) Phase angle error

(b) Both ratio and phase angle errors

(c) Ratio error, reduction in phase angle error is incidental

(d) None of the above

7. The value of resistance of an earthing electrode depends upon:

(a) Size of electrode (b) specific resistance of soil

(c) Width of electrode is driven into earth (d) thickness of electrode

8. A Wheatstone bridge cannot be used for precision measurements because errors are introduced into on account of

(a) Resistance of connecting leads (b) Thermo electric emfs

(c) Contact resistances (d) All of the above

9. 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 and medium Q coils

10. Frequency can be measured by using

(a) Maxwell's bridge (b) Schering bridge

(c) Heaviside Campbell Bridge (d) Wien's bridge

PART B (10 x 2 = 20 Marks)

11. What is meant by transfer instruments?
12. What is sensitivity of voltmeters?
13. Define Creep.
14. How do you adjust the breaking torque in energy meter?
15. What is the need for bridge sensitivity?
16. Why DC potentiometers cannot be used for AC measurements straight away?
17. List the parameters that are affecting the performance of Current Transformer
18. Draw the general A.C. Bridge and derive the general equation at balance condition.
19. List out the different types of sources use in the A.C. Bridge.
20. What are the various detectors used in AC bridges?

PART C (5 x 14 = 70 Marks)

21. a) Describe the construction and working of PMMC instrument. Derive the equation for deflection if the instrument is spring controlled.

(OR)

b) Derive the torque equation of moving iron type of instrument and explain the shape of the scale.

22. a) Describe the constructional details of an electrodynamometer type wattmeter with a neat diagram.

(OR)

b) Describe the constructional details of a 1φ induction type energy meter. Also, explain how the deflecting torque exactly proportional to power

23. a) Describe the construction and working of a Drysdale type potentiometer. How is it standardized? Also, explain how an unknown Voltage can be measured by using this potentiometer?

(OR)

b) Describe the design and constructional features used in current transformers and Explain possible errors due to various sources.

24. a) What are the methods available for high resistance measurement? With neat diagrams Explain. a) Loss of charge method b) Megger.

(OR)

b) Draw the circuit of a Wheatstone bridge and derive the conditions for balance and derive the expression for galvanometer sensitivity and bridge sensitivity.

25. a) Derive the equations of balance for an Anderson's Bridge. Draw the phasor diagram for the conditions under balance. Discuss the advantages and disadvantages of the bridge equation.

(OR)

b) With neat diagram and necessary equations explain how Schering Bridge is used for capacitance measurement.

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