Code No: 126AH

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech III Year II Semester Examinations, May - 2016
ELECTRICAL AND ELECTRONICS INSTRUMENTATION
(Electrical and Electronics Engineering)

Time: 3 hours
Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B
consists of 5 Units. Answer any one full question from each unit. Each question carries
10 marks and may have a, b, c as sub questions.

PART - A (25 Marks)

1.a) What are the requirements of multiplier? [2]
  b) What are the Errors in moving iron Instruments. [3]
  c) What is A.C potentiometer? Give the applications of A.C potentiometer. [2]
  d) Comment for the effect of power factor of secondary circuit of potential transformers.
[3]
  e) Define the phantom loading. [2]
  f) Why it is necessary to make the potential coil circuit purely resistive? [3]
  g) What are the different methods for measurement of medium resistance? [2]
  h) What are the different sources of errors in a.c bridges? [3]

  i) Classify the Transducers. [2]
  j) Give the applications of CRO. [3]

PART - B (50 Marks)

2.a) Derive the equation for deflection of a PMMC in spring controlled.
  b) Explain the methods for linearize of scale of repulsion type of moving iron instrument.
[5+5]

OR
3.a) With neat block diagram, Explain the attracted disc type Electrometer in detailed.
  b) Discuss the sensitivity of voltmeters in detail. [6+4]

4. Draw the equivalent circuit and phasor diagram of a current transformer. Derive he
expressions for ratio and phase angle of errors. [10]

OR
5.a) Why a potentiometer does not load the voltage source whose voltage is being
determined?
  b) A Potentiometer consisting of a resistance dial having 15 steps of 10 ohm each and a
series connected slide wire of 10 ohm which is divided into 100 divisions. If the
working of current of the potentiometer is 15 mA and each division of the slide wire
can read accurately up to 1/5 of its span. Calculate the resolution of the potentiometer
in volts. [5+5]

6.a) What is the lag adjustment is provide in induction type single phase energy meter?
  b) How C.T and P.T can be used to external the range of energy meter?   [5+5]

OR

7.a) Derive the torque equation of an Electrodynameter type of wattmeter.
  b) Explain why errors are large when the power factor is low.   [6+4]

8. Obtain the equations for balance in case of Maxwell's inductance and capacitance bridge with necessary phasor diagram.   [10]

OR

9.a) Explain the loss of charge method for measuring high resistance.
  b) A highly sensitive galvanometer can detect a current as low as 0.1 nA. This galvanometer is used in a Wheatstone bridge as a detector. The resistance of galvanometer is negligible. Each arm of the bridge has a resistance of 1K ohm. The input voltage applied to the bridge is 20V. Calculate the smallest change in the resistance, which can be detected.   [5+5]

10.a) Explain the working principle of strain gauge. Derive its guage factor.
  b) Give the applications of thermistors.   [6+4]

OR

11. Derive the expression for vertical deflection of an electron beam in a CRT with neat sketches.   [10]

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