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325453(24)

BE (4th Semester)
Examination, April-May, 2018

(New Scheme)

**Electrical Measurements &
Measuring Instruments**

Time Allowed : 3 hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : (i) Part (a) of each question is compulsory.
Attempt any two parts from (b), (c) and (d).

(ii) The figures in the right-hand margin indicate marks.

1. (a) Classify resistances from the point of view of measurements giving their suitable ranges. [2]
(b) Explain with the help of a neat schematic the voltmeter-ammeter method to measure medium resistance. [7]

[2]

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- (c) Explain in detail the loss of charge method for the measurement of high resistance. [7]
(d) Explain in brief the working of a polar type AC potentiometer. [7]
2. (a) What is Q -factor of a coil? Which bridge is suitable for measurement of inductance of high Q -factor coils? [2]
(b) How can the frequency be determined using an AC bridge? Draw this bridge and derive the balance condition. [7]
(c) Draw the circuit diagram of Anderson's bridge. Derive the balance condition. Also draw the phasor diagram. [7]
(d) Explain the working of Wagner earthing device. [7]
3. (a) What is the principle of operation of a d'Arsonval galvanometer? [2]
(b) Explain with the help of a neat sketch the working of a vibration galvanometer. [7]
(c) Explain with the help of a diagram the main parts of a Cathode Ray Tube (CRT). [7]
(d) Explain phase angle measurement using Lissajous figure method. [7]
4. (a) Give the classification of measuring instruments. [2]

- (b) Describe the construction and working of a PMMC type of instrument. Derive the torque equation. [7]
- (c) The resistance of moving-coil voltmeter is 11 kilo-ohms. The moving coil has 100 turns and is 40 mm long and 30 mm wide. The flux density in the air gap is 0.05 Wb/m^2 . Determine deflection produced by 220 V, if the spring control gives a deflection of 1° for a torque of $20 \times 10^{-7} \text{ N-m}$. [7]
- (d) Describe the construction and working of rotating and static type phase sequence indicators. [7]
5. (a) Enlist the errors in dynamometer-type wattmeter. csvtuonline.com [2]
- (b) Explain the construction and working of single-phase induction type energy meter. [7]
- (c) Explain in brief the working principle of a dynamometer-type wattmeter. How can it be made to read DC as well as AC? [7]
- (d) Explain the methods of testing energy meters. [7]