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RETEST EXAMINATION - 2019

Semester : 4th (Old)

Subject Code : EI-403

**ELECTRICAL MEASUREMENT AND
MEASURING INSTRUMENT - I**

Full Marks - 70

Time - Three hours

The figures in the margin indicate full marks
for the questions.

Instructions :

1. Questions on PART - A are compulsory.
2. Answer any *five* questions from PART - B.

PART - A

Marks - 25

1. Fill in the blanks : $1 \times 10 = 10$
 - (a) Megger is a combination of an ohmmeter and a _____.
 - (b) Low resistance is measured by _____ bridge.

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- (c) In a purely capacitive circuit the power factor is ____.
- (d) PMMC instruments have ____ scale.
- (e) In PMMC instrument, the deflecting torque is proportional to ____.
- (f) Eddy current damping is provided in ____ instruments.
- (g) A ____ control instrument is more advantageous than a gravity control instrument.
- (h) ____ is used for extension of range of ammeter.
- (i) Maxwell bridge is used to find ____.
- (j) MI instrument is used to measure ____ quantity.
2. Write true or false : $1 \times 10 = 10$
- (a) PMMC instruments are used on DC only.
- (b) Range of medium resistance is from 1 ohm to 100000 ohm.
- (c) A single phase wattmeter can be used to measure 3-phase power.
- (d) A potentiometer is used to calibrate voltmeter.

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- (e) The fixed coil of the electrodynamic wattmeter is used as potential coil.
- (f) De Sauty bridge is used to measure capacitance.
- (g) MI instruments have linear scale.
- (h) For extending the range of voltmeter, we use shunt.
- (i) Energy meter is an integrating type of instrument.
- (j) The terms accuracy and precision are same.
3. Choose the correct answer : $1 \times 5 = 5$
- (a) A voltmeter is an
- (i) indicating instrument
- (ii) integrating instrument
- (iii) recording instrument
- (iv) None of the above
- (b) The lower end of scale of an MI instrument is
- (i) congested
- (ii) equidistant
- (iii) None of the above

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[Turn over

(c) The controlling torque of an indicating instrument increases as the deflection of the moving system

(i) decreases

(ii) increases

(iii) remains unchanged

(iv) None of the above

(d) Wheatstone bridge is used to measure

(i) low resistance

(ii) medium resistance

(iii) high resistance

(iv) None of the above

(e) Hay's bridge is used to find unknown

(i) resistance

(ii) capacitance

(iii) inductance

(iv) None of the above.

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4. Answer the following :

(a) Derive the dimensional analysis of the following terms : 6

(i) resistance

(ii) capacitance

(iii) inductance

(b) Define :

(i) Accuracy

(ii) Precision

(iii) Reproducibility

5. Answer the following :

(a) Explain the term "standardization of a potentiometer". 4

(b) Explain the construction and working principle of a moving coil instrument. 3

(c) Mention the advantages of PMMC instruments. 2

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[Turn over

6. Answer the following :

- (a) What is resistance and how you can classify it ? 3
- (b) Mention the advantages of MI instruments. 2
- (c) Explain how the ammeter is calibrated with the help of a potentiometer. 4

7. Answer the following :

- (a) Explain the use of multiplier as a device for extending the range of voltmeter. 4
- (b) A moving coil instrument gives a full scale deflection of 10 mA when the p. d. across its terminals is 100 mV. Calculate the shunt resistance for a f. s. d. corresponding to 100A. 3
- (c) Write uses of megger. 2

8. Answer the following :

- (a) How is the Maxwell's inductance bridge used to measure self inductance of a coil ? 6
- (b) What are the advantages and disadvantages of the megger ? 3

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9. Answer the following :

- (a) Write a short note on hot wire instrument. 6
- (b) State the fundamental and derived units. Give examples. 3

10. With a neat diagram, describe how medium resistance is measured with the help of Wheatstone bridge. 9

11. Explain how the De Sauty bridge is used to measure capacitance. Draw its phasor diagram. 6+3=9

12. Describe with neat sketches the working principle and construction of MI instruments. Mention their advantages. 6+3=9

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