16117
3 Hours / 100 Marks

Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory*.

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Solve any TEN of the following : **20**

(a) Name any two Electrical effects employed in measuring instruments.

(b) List the methods for extension of range of DC/AC ammeter and voltmeter.

(c) An U.P.F. wattmeter is rated for 300/600 V, 5 A/ 10 A with F.S.D. of 1500 W. What is the M.F. ?

V / I	300	600
5		
10		

(d) In two wattmeter method of power measurement one of the meter shows negative reading, how the meter connections to be altered to show correct reading.

(e) State the meaning of creeping error in energy meter and how it is prevented.

(f) Explain how Megger can be used for testing insulation resistance of cable.

(g) Name any two types of frequency meter.

(h) State the meaning of indicating and integrating instruments and give one application of it.

(i) Give advantages of MI instruments and disadvantages of PMMC instrument.

(j) Energy meter is integrating type measuring instrument. Explain.

(k) State the classification of resistances as per their values.

(l) State the use of phase sequence indicator and clip on-ammeter.

(m) State the use of energy meter constant.

2. Solve any TWO of the following : **16**

(a) Give the classification of measuring instrument. Also state the classification of errors in analog measuring instrument.

(b) Explain how instrument transformer can be used for extension of meters. What are the advantages of instrument transformer over shunt and multipliers ?

(c) Explain with neat diagram, construction and working of attraction type moving iron instrument.

3. Solve any TWO of the following : **16**

(a) Describe three types of torques required in analog type measuring instrument.

(b) With neat diagram describe construction and working of PMMC type measuring instrument.

(c) Describe any four errors with their compensation in electrodynamometer type wattmeter.

4. Solve any TWO of the following : **16**

(a) A moving coil instrument gives a F.S.D. of 5 m Amp when potential difference across its terminal is 50 mV calculate :

(i) The shunt resistance for a full scale reading corresponding to 50 A.

(ii) The series resistance for full scale reading with 500 V.

(iii) Calculate power dissipated in (i) and (ii).

(b) Explain with neat diagram construction and working of electrodynamometer type wattmeter.

(c) Draw circuit diagram for measurement of 3ϕ active power and reactive power using one wattmeter. Explain effect of power factor on reading of wattmeter.

5. Solve any TWO of the following : 16

(a) Two wattmeters connected to measure 3ϕ power, gives reading of 3000 W and 1000 W respectively. Find power factor of circuit,

(i) When both readings are positive.

(ii) When readings of 1000 W is obtained after reversing C.C. of Second Wattmeter.

(b) (i) Describe the method of measurement of medium resistance by using simple V-I method.

(ii) Compare Analog and Digital multimeter. (any four points)

(c) Explain with diagram construction and working of 1ϕ dynamometer type power factor meter.

6. Solve any TWO of the following : 16

(a) Explain the working of digital energy meter with neat sketch. What are the advantages of Digital Energy meter over Analog meter.

(b) Draw neat labelled diagram of Megger showing constructional details. How insulation resistance of transformer is measured with the help of diagram.

(c) Explain with diagram, construction and working of each of the following :

(i) Weston type frequency meter

(ii) Phase sequence indicator.

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