

17322

21718

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.
 - (8) Use of steam tables, logarithmic, Mollier's chart is permitted.

Marks

1. Attempt any TEN of the following :

2 × 10 = 20

- (a) Define accuracy & precision.
- (b) List any four effects employed in measuring instrument.
- (c) State working principle of PMMC instrument.
- (d) Show how ammeter & voltmeters are connected in ckt for measurement of current & voltage.
- (e) Write any two advantages of MI type instrument.
- (f) State the material used for moving coil & former for PMMC instrument.
- (g) List one advantage and one disadvantage of one wattmeter method.
- (h) Draw power triangle & state all powers.
- (i) Write any two advantages of digital energy meter.

[1 of 4]

P.T.O.

- (j) Why energy meter is integrating type measuring instrument ?
- (k) Find multiplying factor of 10 A/300 V for unity P.F. with having FSD = 1500 W.
- (l) Give classification of resistance based on their ranges.

2. Attempt any FOUR of the following :

4 × 4 = 16

- (a) Describe with neat diagram air friction damping.
- (b) Draw a neat labelled diagram of PMMC instrument.
- (c) How range of A.C. ammeter & A.C. voltmeter is extended ? Draw suitable dia.
- (d) List the different errors in wattmeter & explain compensation for it.
- (e) Explain construction & working of electrodynamic type wattmeter.
- (f) Compare analog & digital multimeter. (any 4 points)

3. Attempt any FOUR of the following :

4 × 4 = 16

- (a) A moving coil instrument with full scale deflection of 100 mA & internal resistance of 20 Ω . Calculate the value of shunt required to be connected in parallel to measure current of 20 A & value of multiplier required to measure voltage of 400 V.
- (b) Explain magnetic effect & heating effect of electric current.
- (c) Describe procedure for calibration of ammeter with diagram.
- (d) Define active power, reactive power & apparent power. Also write unit of them.
- (e) Define power factor. Draw neat diagram for 1 ϕ dynamometer type p.f. meter.
- (f) Draw neat labelled sketch of megger.

4. Attempt any FOUR of the following :

4 × 4 = 16

- (a) Explain spring control method with neat diagram.
- (b) Compare PMMC & MI instrument.
- (c) Draw circuit diagram for 3 ϕ active & reactive power using one wattmeter.
- (d) Explain effect of load P.F. on reading wattmeter in two wattmeter method.
- (e) List any four errors in induction type energy meter. Give method of compensation for each.
- (f) Explain working of Weston type frequency meter.

5. Attempt any FOUR of the following :

4 × 4 = 16

- (a) Write difference between absolute & secondary instrument. (Any four points)
- (b) Explain construction & working of attraction type M.I. instrument with neat diagram.
- (c) Two wattmeters are connected in circuit for measurement of 3 ϕ power. One wattmeter reads 2500 W & other reads 1500 W. Find P.F. of circuit when
 - (i) Both readings are positive.
 - (ii) When reading of 1500 W is obtained after reversing current coil of wattmeter.
- (d) Explain with neat diagram power measurement using two wattmeter method.
- (e) State the application of phase sequence indicator, clip on ammeter, frequency meter & P.F. meter.
- (f) Explain with neat diagram Weston type frequency meter.

P.T.O.

6. Attempt any **FOUR** of the following :

4 × 4 = 16

- (a) State the functions of controlling torque. Write two types of it.
 - (b) With neat diagram explain calibration of energy meter by direct loading method.
 - (c) Explain V-I method of measurement of medium resistance.
 - (d) Draw a neat labelled diagram of LCR meter.
 - (e) Draw block diagram of CRO. Write function of each block.
 - (f) Draw block diagram of function generator. Write applications of function generator.
-