

22325

11819

3 Hours / 70 Marks

Seat No.

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- 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.

Marks

1. **Attempt any FIVE of the following:** **10**
- State the necessity of measurement necessity?
 - State the meaning of the following:
 - Sensitivity
 - Deflecting torque
 - State the full form of PMMC and PMMI.
 - Represent the vector representation of power triangle.
 - State the types of errors (Any four).
 - State the meaning of CT's.
 - List differences between absolute and secondary instrument.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) State the desirable qualities of measuring instrument and explain any two in brief.
 - b) With neat sketch of PMMC instrument explain its working briefly.
 - c) List out comparisons between CT's and PT's (Any four).
 - d) State errors occurring in measurement of electrical power.
- 3. Attempt any THREE of the following:** **12**
- a) A moving coil instrument gives full scale deflection of 24 mA. When a P.D. across it is 108 mV. Find the value of –
 - (i) Series resistance for full scale deflection of 400 V.
 - (ii) Find the power consumption.
 - b) Explain the working of single phase electronic energy meter with sketch.
 - c) State the merits and demerits of power measurement using 2-wattmeter method.
 - d) With the neat sketch explain working of Dynamometer type wattmeter.
- 4. Attempt any THREE of the following:** **12**
- a) Draw a neat labelled diagram of 3-phase electronic energy meter.
 - b) State and explain working of phase sequence indicator with suitable sketch.
 - c) State/Describe the construction and working of Weston type frequency meter with labelled diagram.
 - d) State the differences between analog instruments and digital instruments.
 - e) State the necessity and construction of earth tester with suitable sketch.

5. Attempt any TWO of the following:**12**

- a) Three identical coils each of $(4 + j5) \Omega$ are connected in S far across 415V, 3-phase 50 Hz supply find
- (i) V_{ph}
 - (ii) I_{ph}
 - (iii) Wattmeter readings W_1, W_2 .
- b) Describe with sketches the various blocks and working of signal generator.
- c) State the necessity of synchroscope and with neat sketch explain its working.

6. Attempt any TWO of the following:**12**

- a) Draw the neat labelled diagram showing the controls available on front panel of CRO.
- b) State the necessity of extension of Ammeter using shunt with mathematical derivation if necessary.
- c) State errors occurring in wattmeter and suggest method for overcoming such types of errors (Any six).
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