

17637

11819

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.
 - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. (A) Attempt any **THREE** of the following :

12

- (a) State the factors on which severity of electric shock depends.
- (b) State any four advantages of preventive maintenance.
- (c) List any eight contamination agents of the transformer oil.
- (d) State any **one** application of each tool
 - (i) Earth tester
 - (ii) Megger
 - (iii) Bearing puller
 - (iv) Growler

(B) Attempt any **ONE** of the following :

6

- (a) Derive an equivalent circuit of 3 phase Induction motor step by step. Write equations related to circuit and explain in brief.
- (b) State the objective of testing. Explain the role of BIS (Bureau of Indian Standards) in testing of electrical machines.

- 2. Attempt any TWO of the following :** **16**
- (a) State any eight safety precautions to be followed while working with an electric installation.
 - (b) (i) Describe the factors affecting preventive maintenance schedule.
(ii) State the procedure for developing preventive maintenance schedule.
 - (c) Prepare troubleshooting chart for transformer as per IS 10028-1981 (4 trouble) and Induction motor (4 troubles).
- 3. Attempt any FOUR of the following :** **16**
- (a) List any four internal causes for abnormal operation of electrical equipments.
 - (b) List routine tests to be conducted on 3 phase transformer as per IS 2026-2011.
 - (c) State and explain properties of transformer oil.
 - (d) State the methods used to measure insulation resistance and explain Dielectric Absorption method.
 - (e) Draw vector diagram of 3 phase induction motor as a generalized transformer & name it.
- 4. (A) Attempt any THREE of the following :** **12**
- (a) Explain open Delta (Δ/Δ) test on transformer.
 - (b) Describe Effect of misalignment of direct coupled drives.
 - (c) State the basic requirements of foundation for
 - (i) Static equipments
 - (ii) Rotating equipments
 - (d) State any eight causes of fire.
- (B) Attempt any ONE of the following :** **6**
- (a) Explain vacuum impregnation method used for Revarnishing of insulation with neat diagram.
 - (b) Following test results were obtained on 250/125 V transformer having 2.5 kVA rating on S.C. Test at 30 °C $I = 8A$, $V = 36V$, Power = 128 W. Equivalent Resistance winding is 1.8 Ω . Calculate % Resistance % impedance & full load loss of transformer at full load working temperature of 75 °C.

5. Attempt any TWO of the following :**16**

- (a) Classify the insulating materials as per operating temperature. Give two examples of each type.
- (b) State the methods of Neutral Grounding. State difference between Earthing and grounding.
- (c) A three phase 400 V I.M. gave following readings :

No Load Test : 400 V, 1260 W, 9A

Short Circuit Test : 140 V, 4000 W, 38A

Draw circle diagram and find current, p.f. and slip at full load, if Motor rating is 14.9 kW.

6. Attempt any FOUR of the following :**16**

- (a) Describe any four methods used to reduce earth resistance.
 - (b) Explain importance and purpose of earthing.
 - (c) Compare direct and Indirect method of testing.
 - (d) State types of maintenance. Explain each with example.
 - (e) Explain the procedure to perform S.C. Test on 1ϕ transformer with circuit diagram.
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