

17637

21718

3 Hours / 100 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.
 - (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 any four objectives of the preventive maintenance of electrical machines.
- (b) List out any eight properties of transformer oil.
- (c) What is the effect of misalignment on the performance of machine ?
- (d) Draw any four Safety Symbols.

(B) Attempt any ONE of the following : 06

- (a) State objective of routine, type and special test. Give example of each.
- (b) What is indirect method of testing ? What are its advantages and drawbacks ?

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

- (a) State any eight factors on which severity of shock depends.
- (b) Distinguish between routine maintenance and breakdown maintenance of electrical equipments.
- (c) State the methods of purifying and drying out the transformer oil and explain any one method in brief with neat sketch.

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

- (a) State any four external causes of failure of equipments.
- (b) What is Growler ? State working and use of it.
- (c) List out and explain any one test to be carried on transformer oil.
- (d) State different methods for measurement of insulation resistance. Explain one in brief.
- (e) Draw a neat circuit diagram to perform O.C. and S.C. test on single phase transformer with all meter rating marked for a 2 kVA, 230/115 V single phase transformer.

4. (A) Attempt any THREE of the following :**12**

- (a) How will you perform direct loading test on 3 ϕ induction motor ? Draw necessary circuit diagram.
- (b) State any four factors on which earth resistance depends.

- (c) State the function of following tools :
- (i) Bearing puller
 - (ii) Filler guage
 - (iii) Dial tester
 - (iv) Spirit level
- (d) State any eight precautions to be taken to avoid fire due to electrical reasons.

(B) Attempt any ONE of the following :

06

- (a) A three phase 415 volts, 5.5 kW induction motor gives following results :

No load test : 415 V, 4.6A, $W_1 = 1000$ W, $W_2 = - 560$ W

Blocked roter test : 98 V, 10 A, $W_1 = 770$ W, $W_2 = - 160$ W

Using scale 1 cm = 2 A, find power scale.

- (b) State classification of insulating materials as per IS : 1271 – 1958. State temperature limits and one example of each.

5. Attempt any TWO of the following :

16

- (a) Explain the open delta (delta-delta) test on transformer.
- (b) State factors involved in designing the machine foundation.
- (c) State the objective and procedure of performing reduced voltage running up test on 3-ph induction motor.

P.T.O.

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

- (a) Prepare chart for maintenance schedule of distribution transformer as per ISS : 10028-1981.
 - (b) State and explain effects of misalignment in rotating machines.
 - (c) Draw circuit diagram for back to back test on transformer.
 - (d) Prepare a trouble shooting chart for 3 ϕ sq. case induction motor. (any 4)
 - (e) A 110 kVA, 1 ϕ - transformer has a ratio of 1100/440 V the wattmeter reading on O.C. test is 1100 W if the secondary winding S.C a voltage of 500 V at normal frequency applied to primary produces full load current the wattmeter is 1000 W. Calculate : (i) Secondary voltage, (ii) efficiency when current of 250 A at lagging PF is taken by a load connected to low voltage terminal. The primary voltage being 1100 V.
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