

17637

21819

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) 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. a) **Attempt any THREE of the following:** **12**
 - (i) State the factors on which severity of electric shock depends. Also state the effect of current on human system.
 - (ii) State the importance of electrical maintenance. State different categories of maintenance.
 - (iii) State and explain the properties of transformer oil (any four).
 - (iv) State any four troubles in case of D.C machines.

- b) **Attempt any ONE of the following:** **6**
 - (i) Draw the modified equivalent circuit of induction motor referred to stator diagram. Explain each components.
 - (ii) With the help of neat circuit diagram explain back to back test on single phase transformer to determine efficiency and regulation.

P.T.O.

- 2. Attempt any TWO of the following:** **16**
- a) State the causes of fire due to electrical faults. Describe the operation of fire extinguishers.
 - b) Prepare the maintenance schedule for three phase induction motor as per IS 900-1992
 - c) Prepare a trouble shooting chart for transformer as per IS 10028-1981.
- 3. Attempt any FOUR of the following:** **16**
- a) State any four internal causes for the abnormal operation of electrical equipments.
 - b) State the objectives of the testings.
 - c) State the classification of insulating materials as per IS 1271- 1985. With maximum operating temperature and with two examples of each.
 - d) Define the term 'Polarization Index'. How is it used for interpreting the condition of insulation?
 - e) Compare direct and indirect method of testing (any four points).
- 4. a) Attempt any THREE of the following:** **12**
- (i) Describe the procedure of measuring dc resistance of transformer winding with the help of circuit diagram and related formulae.
 - (ii) Describe any four methods used for reducing earth resistance.
 - (iii) Distinguish between installation earthing and system earthing.
 - (iv) State any four Do's and Don'ts regarding safety while working on electrical installations.

b) Attempt any ONE of the following:

6

- (i) Draw a neat diagram of vacuum impregnation plant and write stepwise procedure of revarnishing the insulation.
- (ii) Explain with circuit diagram the open circuit voltage ratio test on 3 phase slip ring induction motor.

5. Attempt any TWO of the following:

16

- a) State the necessity of drying out of transformers. Give the procedure of drying out of transformers both by external and internal heat methods.
- b) What are the basic requirements of foundation for
 - (i) Static equipments
 - (ii) Rotating machines.
- c) A 400 V, 40 HP, 50 Hz, 4 pole delta connected induction motor gave the following test data: No load test: $V_0 = 400$ V, $I_0 = 20$ A, $W_0 = 1200$ W, Blocked rotor test: $V_{sc} = 100$ V, $I_{sc} = 45$ A, $W_{sc} = 2800$ W, Draw circle diagram and determine:
 - (i) The line current and power factor at rated output
 - (ii) The maximum output
 - (iii) The maximum torque
 - (iv) The full load efficiency
 - (v) The full load rotor speed. Assume stator and rotor copper losses to be equal at standstill

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

- a) List the devices and tools required for loading and unloading; lifting and carrying heavy electrical equipments.
 - b) State the effects of mis-alignment in rotating machines.
 - c) Define the tolerances. Give the values of tolerances for power transformer as per IS 2026-2011.
 - d) Describe the factors affecting the preventive maintenance schedule.
 - e) List the routine tests conducted on synchronous generator as per IS 7132-1973.
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