

# 17637

**11920**

**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) 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.
  - (7) Use of Steam tables logarithmic, Mollier's chart is permitted.

**Marks**

- 1. a) Attempt any THREE of the following:** **12**
- (i) State the list of any four safety signs with symbols used in industry.
  - (ii) Define Break down maintenance. State any four causes of breakdown of electrical equipments.
  - (iii) State the methods of measurement of insulation resistance and explain the meaning of infinity and zero reading.
  - (iv) Enlist the agents which contaminating the insulating oil.

P.T.O.

- b) **Attempt any ONE of the following:** **6**
- (i) Compare direct and in-direct method of testing.  
(Any two points) Also write any two advantages and two disadvantages of indirect testing
  - (ii) State why H.V. test on transformer is performed?  
Explain any one method of H.V. test.
2. **Attempt any TWO of the following:** **16**
- a) State the causes of fire due to electrical faults. What precautions should be taken to avoid fire due to electrical reasons ?
  - b) Describe the factors affecting preventive maintenance schedule.
  - c) Prepare a trouble shooting chart for 3 ph induction motor.
- 3 **Attempt any FOUR of the following:** **16**
- a) State any four external causes for the abnormal operation of electrical equipments.
  - b) Explain in brief the use of filler gauge, growler, spirit level and dial indicator.
  - c) Describe how you will carry out re-varnishing of insulation using hot-dip method.
  - d) State and explain the properties of transformer oil.
  - e) Draw and explain polarity test on 1 ph transformer.
4. a) **Attempt any THREE of the following:** **12**
- (i) Explain how a voltage ratio test is performed on 3 ph slip ring I M.
  - (ii) Compare on any four points between neutral earthing and equipment earthing.
  - (iii) Describe the effects of misalignment.
  - (iv) State different factors on which severity of electric shock depends.

b) Attempt any ONE of the following:

06

- (i) State why is it necessary to check insulation resistance regularly and keep records? State the method of measurement of insulation resistance by megger.
- (ii) With the help of neat circuit diagram explain back to back test on transformer to determine efficiency and regulation.

5. Attempt any TWO of the following:

16

- a) State why filtering of transformer oil is required? Explain with figure any one method of filtering transformer oil.
- b) Describe the procedure for levelling and aligning of direct coupled and indirectly coupled drive.
- c) The following results were obtained from the tests on a 4.5 kW, 3 phase, 220 V, 50 Hz, 4 poles star connected induction motor. No load test: 220 V, 6A, 450 W Blocked rotor test: 110 V, 25A, 2150 W. Assume stand still stator copper losses to be 50% of total copper losses. Draw the circle diagram and find out, full load current, efficiency, power factor.

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 factors involved in designing the machine foundation.
  - c) State the objectives of testing of electrical equipments. State Type test and Special test
  - d) State the types of maintenance to be undertaken for electrical machines. Explain in brief the purpose of any two types of maintenance.
  - e) List the routine tests conducted on 1 phase induction motor
-