

17637

15162

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

- (i) How will you prevent electrical accidents?
(Any four points)
- (ii) Define Break down maintenance. State any four causes of breakdown of electrical equipments.
- (iii) List out any eight contraminations agents of transformer oil.
- (iv) State any four troubles in case of D.C. machines.

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 the objectives of testing of electrical equipments.
(Any four) Also define:
 - 1) Type test
 - 2) Special test

P.T.O.

- 2. Attempt any TWO of the following:** **16**
- a) State any eight precautions to be taken to avoid of electrical fire.
 - b) Discuss any six factors which effect the preventive maintenance schedule.
 - 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) With a neat sketch, explain the procedure to find out temperature rise of winding of a 3-ph I.M. using resistance measurement method.
 - c) State any eight causes of contamination of transformer oil.
 - d) Give the classification of insulating materials as per the operating temperature with two examples of each type.
 - e) Draw a neat circuit diagram to perform sumpners test on single ph. transformers with all the meter ratings marked for a 2 KVA 230/115 V single phase transformer.
- 4. a) Attempt any THREE of the following:** **12**
- (i) How will you measure the dc resistance of a two winding transformer? Draw the necessary circuit diagram.
 - (ii) State the factors that affect the value of earth resistance. (Any four)
 - (iii) State any eight devices and tools used for lifting, loading/unloading and carrying heavy electrical machines during installation.
 - (iv) State any eight causes of fire.

b) Attempt any ONE of the following:

6

- (i) State the methods of Re-varnishing of insulation and give the procedure of vacuum impregnation method. (Diagram not necessary.)
- (ii) Following readings are obtained in a back to back test on two identical 100 KVA, 1-ph transformers. Reading of wattmeter connected on supply lines is 2 kw. Reading of wattmeter connected in secondary circuit, when full load current circulates through the secondary is 4 kw.

Calculate the efficiency of each transformer

- 1) At full load and unity p.f.
- 2) At $\frac{1}{2}$ full load and unity p.f.

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) State the objective and procedure to perform a reduced voltage running up test on a 3-ph squirrel cage I.M. Draw the necessary circuit diagram.

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

- a) What are the points to be considered while selecting the site for the location of indoor transformer as per IS 1886?
(any four)
- b) State the effects of misalignment in rotating machines.
- c) Following test results were obtained on a 1-ph, 2.5 KVA, 250/125 V transformer, short circuit test on high voltage side.

$$V_{SC} = 36 \text{ V}$$

$$I_{SC} = 8 \text{ A}$$

$$W_{SC} = 128 \text{ W}$$

Calculate :

Resistance and impedance of transformer at 75°C referred to high voltage side. The test is conducted at ambient temp. of 30°C.

- d) Prepare maintenance schedule for storage batteries.
 - e) Draw the vector diagram of 3 phase induction motor and write the equipments related to vector diagram.
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