

9142

21011

3 Hours / 80 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) Assume suitable data, if necessary.
(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

1. Attempt any **FOUR** of the following : **16**
- a) What are the causes of electrical accidents?
 - b) Explain the procedure to be followed to rescuing a person.
Who have received an electric shock?
 - c) Prepare maintenance schedule for alternator as per 4884-1968.
 - d) State various conditions for parallel operation of 3 ϕ transformer.
 - e) Explain the procedure to be followed in aligning two shafts to be
 - (i) Directly coupled and
 - (ii) Indirectly coupled.
 - f) Explain the use of following tools :
 - (i) Filler Gauges
 - (ii) Growlers
 - (iii) Megger and
 - (iv) Dial Indicator

P.T.O.

2. Attempt any THREE of the following : 12

- a) State the factors on which severity of shock depends.
- b) Draw a neat labelled sketch and state the procedure to perform break test on DC Series Motor.
- c) Prepare troubleshooting chart for failures of single phase Induction Motor.
- d) What are the requirement of foundations for installing rotating electrical machines as per IS 900-1992.

3. Attempt any THREE of the following : 12

- a) Explain one dark and two bright lamp method of synchronism with suitable sketches and phasor diagram.
- b) State external causes of failure of equipment.
- c) List common troubles in electrical installations and cables.
- d) List out the used various devices and tools in loading and unloading of heavy electrical equipments.

4. Attempt any TWO of the following : 16

- a) A total load of 800kVA at 0.8 P.F. lagging is shared by two transformers of equal voltage ratio but different ratings and impedances. Find the load shared by each transformer and power shared by each transformer and power factor of each transformer.

$$\text{KVA } 1 = 600 \quad R_1 = 0.012\Omega \quad X_1 = 0.06\Omega$$

$$\text{KVA } 2 = 300 \quad R_2 = 0.014\Omega \quad X_2 = 0.045\Omega$$

- b) A short ckt test was carried out to find impedance and load losses on a 1KVA, 230/115V single phase transformer and following are the observations of primary side of transformer.
- (i) Short circuit current $I_{sc} = 4.35A$
 - (ii) Short circuit voltage $V_{sc} = 9V$
 - (iii) $Cw_{losses} = \text{short circuit power } P = W_{sc} = 35W$
calculate :
 - (1) Resistance at $75^{\circ}C$
 - (2) Impedance at $75^{\circ}C$
 - (3) Impedance voltage at $75^{\circ}C$
 - (4) Copper loss at $75^{\circ}C$

Neglect stray losses on short circuit condition and Assume that Room temp = $30^{\circ}C$

- c) Explain in brief, how the cleaning of insulation covered with loose dry dust sticky dirt, oily viscous film is carried out.

5. Attempt any TWO of the following :

12

- a) State the properties of good transformer oil. List out the various tests to be performed on transformer oil.
- b) State objectives of testing of machines? Explain in brief Routine test, Type test and Special test, Supplementary test.
- c) Give maintenance schedule of three phase Induction Motor as per IS 9001 : 1992.

6. Attempt any **TWO** of the following :

12

- a) Explain with neat sketch Back to Back test for efficiency of transformer.
 - b) State the factors affecting preventive maintenance schedule state the advantages of preventive maintenance schedule.
 - c) State various methods of revarnishing. Explain with neat sketch vacuum impregnation method of varnishing.
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