

314322

25226

3 Hours / 70 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. Attempt any FIVE of the following : 10
- a) State the two types of armature winding based on their winding pattern.
 - b) State the working principle of DC Motor.
 - c) State two advantages of three phase transformer, over bank of three single phase transformer.
 - d) Define transformation ratio of single phase transformer.
 - e) State any two applications of pulse transformer.
 - f) Classify various losses in single phase transformer.
 - g) Define an instrument transformer.

P.T.O.

2. Attempt any THREE of the following : 12

- a) State the materials used for the following part of DC Motor.
 - i) Pole shoe
 - ii) Yoke
 - iii) Field winding
 - iv) Armature core
- b) Explain the necessity of starter for DC Motor, State two types of DC shunt motor starter.
- c) Compare core type and shell type transformer. (Any four points)
- d) Draw neat sketch of DC generator. Label the following on the sketch.
 - i) Pole
 - ii) Pole shoe
 - iii) Field coil
 - iv) Commutator

3. Attempt any THREE of the following : 12

- a) Derive the emf equation of a single phase transformer.
- b) List the conditions for parallel operation of three phase transformer.
- c) Draw neat winding connection of Delta/star (Δ°/Y) connection, Explain how large unbalance loads can be used with this type of connection.
- d) Explain working principle of single phase transformer with neat diagram.

4. Attempt any THREE of the following : 12

- a) Draw and explain with neat labelled sketch of three point starter.
- b) A 500 KVA transformer has iron losses of 2600 W and copper losses of 7400 W at full load. Calculate its efficiency at full load unity pf and 0.8 pf lagging.
- c) Explain why secondary of (CT) current transformer should never be kept open.
- d) Draw schematic diagram of DC shunt motor and DC series motor with two applications each
- e) A single phase 2200/250 V, 50 Hz transformer has maximum flux 0.0216 Wb calculate no. of turns of primary and secondary.

5. Attempt any TWO of the following : 12

- a)
 - i) Write emf equation of DC generator. State the meaning of each term.
 - ii) A 4 pole, wave wound armature has 720 conductors and rotated at 1000 rpm. If useful flux is 20 mWb, calculate the generated voltage.
- b) Identify the types of DC motor best suited for the following applications, Explain your reasoning.
 - i) Electric traction
 - ii) Paper making
 - iii) Shearing and punching
- c) Describe with suitable diagram speed control of DC shunt motor by field control method.

6. Attempt any TWO of the following :**12**

- a) Draw neat circuit diagram to conduct O.C. and S.C. test on 1 KVA, 230V/115V. 50 Hz, single phase transformer, Justify the range of meter selected for measurement.
 - b) Explain the effect of Harmonics on the operation of transformer.
 - c) With the help of neat diagram, describe the procedure to carry out phasing out test on a 3 phase transformer.
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