22418

12425

03 Hours / 70 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) 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) Define an electric motor.

b) State the function of field winding in DC motor.

c) Classify the different types of motors.

d) State the parts of the motors that are made of silicon steel stampings.

e) State the function of Breather in transformer.

f) State the reason why brushes in DC motor are made of carbon.

g) Write any two features of Auto transformer.

Marks

2.   **Attempt any THREE of the following :**   **12**

a) Draw neat sketch of 3 points starter.

b) State the material used for the following parts of DC motor -

   i)   Pole core

   ii) Frame

   iii) Commutator

   iv) Field winding

c) With neat sketch explain armature voltage control method of speed control used for DC shunt motor.

d) Compare open circuit test and short circuit test of transformer.

3.   **Attempt any THREE of the following :**   **12**

a) Compare core type and shell type transformer on any four parameters.

b) A 200 KVA 3000/250 V 50 Hz single phase transformer has 80 turns on its secondary winding.

   Calculate –

   i)   Primary current

   ii) Secondary current

   iii) Maximum flux

   iv) Primary turns.

c) List out various losses in transformer. State how it can be reduced.

d) State Flemings Left hand rule and Flemings Right hand rule.

Marks

4. **Attempt any THREE of the following :** **12**

   a) State the advantages of three phase transformer over a bank of three single phase transformer.

   b) Give the criteria for selection of power transformer as per IS:10028 (Part I).

   c) State two applications and two features of isolation transformer.

   d) State any four features of welding transformer.

   e) Draw Equivalent circuit of transformer.

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

   a) Compare single phase autotransformer and two winding transformer on following points.

      i) No. of winding

      ii) Efficiency

      iii) Copper saving

      iv) Cost

      v) Electrical isolation

      vi) Voltage Regulation

   b) State need for parallel operation of transformers. Also state two conditions for parallel operation and two advantages of parallel operation.

   c) 30 KVA, 2400/120V, 50 Hz, 1ϕ transformer have $R_1 = 0.1\,\Omega$, $R_2 = 0.035\,\Omega$, $X_1 = 0.22\,\Omega$, $X_2 = 0.012\,\Omega$, Find the equivalent resistance, reactance and impedance referred to primary and secondary side.

Marks

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

a) Find the all day efficiency of 500 KVA distribution transformer whose copper and iron losses at full load are 4.5 KW and 3 KW respectively. It is loaded as under per day.

No. of hours	6	6	6	6
Load in KW	450	300	200	0
P.f.	0.95	0.85	1	–

b) State any six parts of three phase transformer. Also state the function of the part.

c) Compare distribution transformer and power transformer.

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