

(3 Hours)

[Total Marks : 80]

- N.B. :** (1) Question No.1 is compulsory.
 (2) Attempt any **THREE** from the remaining questions.
 (3) **Figures** to the **right** indicate **full marks**.

1. Attempt any **Four** questions :

- (a) What are the advantages of auto transformer over two winding transformer. **5**
- (b) How the losses can be minimise in case of single phase transformer? **5**
- (c) What is Electromechanical Energy Conversion? **5**
- (d) Which speed control methods are used to get the speed above normal and below normal in case of DC Motor? **5**
- (e) List the advantages of Hopkinson's test. **5**
2. (a) Derive the expression for torque developed in singly excited system. **10**
- (b) 5 kVA, 200 / 400 V, 50 Hz single phase transformer gave following test result. **10**
- O.C. Test : 200 V, 0.9 A, 60 W (L. V. Side)
- S.C. Test : 10 V, 6 A, 22 W (H. V. Side)
- Calculate :**
- (i) Efficiency and voltage regulative at full load 0.8.
- (ii) Efficiency at 25% load at unity p.f.
3. (a) Explain the different electrical braking methods for separately excited DC Motor. **10**
- (b) Two single phase transformer with equal voltage ratio having impedance of $(0.819 + j 2.503) \Omega$ and $(0.8 + j 2.31) \Omega$ with respect to secondary. If they operated in parallel how they will share the load of 3000 kw at p.f. 0.9 lagging? **10**

TURN OVER

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4. (a) ---- 10
(b) A conductor of 4 m length moves under a magnetic field of flux density of 1.3 wb/m² with velocity of 1.3 m/s calculate the magnitude of induced e.m.f. if conductor moves 10
(i) An angle of 50° to direction of field and
(ii) At 90° to axis of field.
5. (a) Explain commutation in DC machine also explain the various methods of the improvement. 10
(b) Explain the characteristics of DC series and shunt motors. 10
6. (a) Draw and explain four point starter. 10
(b) Derive the expression for calculation demagnetising ampere turns per pole and cross magnetisly ampere turns per pole. 10