

- N.B :**
1. Question no. 1 is compulsory.
 2. Attempt any three from remaining question.
 3. Figures to the right indicate full marks.

1. Attempt any **four** questions.
 - (a) Explain the Electrochemical energy conversion ? **5**
 - (b) What are the advantages of Hopkinson's test ? **5**
 - (c) Explain the core losses in transformer. **5**
 - (d) Draw the characteristics of D.C. shunt motor. **5**
 - (e) What is the role of commutator in D.C. machine ? **5**

 2. (a) With the help of phasor diagram derive the equation to obtain voltage regulation in single phase transformer. **10**
 - (b) Derive the expression for torque developed in singly excited magnetic field. **10**

 3. (a) 700 kVA single phase transformer with 0.12 p.u. resistance and 0.06 p.u. reactance is connected in parallel with 350kVA transformer with 0.014 p.u. resistance and 0.045pu reactance to share a load of 850 KVA at 0.7 p.f. lagging. If transformer are having common voltage ratio, calculate load shared by each of them. **10**
 - (b) Explain all day efficiency of transformer. **10**

 4. (a) What are the different methods of Electrical braking. **10**
 - (b) Hopkinson's test of two identical shunt machines gave following results. **10**
 Input voltage = 400V, Input current = 10A, output current of generator = 100A, field currents are 3A and 4A, Armature resistance of each machine = 0.06 find the efficiency of motor and generator

 5. (a) 5KVA, 200/600 V, 50 Hz single phase transformer gave following test result. **10**
 O.C. test : 200V, 0.9 A, 60W (L.V.)
 S.C. test : 10V, 6A, 22W (H.V)
 Calculate (i) Efficiency and voltage regulation and full load 0.8. (ii) Efficiency at 25% load at unit p.f.
 - (b) Draw what is the need of starter ? Explain 3 point starter. **10**

 6. Write the short note on
 - (a) Speed control of D.C. shunt motor. **10**
 - (b) Doubly excited magnetic field. **10**
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