

- d) When will rotor resistance dominate rotor reactance and vice-versa in a 3-phase induction motor?
- e) Why bucholz relay is used in transformer ?
- f) What is the function of a centrifugal starting switch in a single phase induction motor?
- g) Why does the rotor of a 3- phase induction motor rotate in the same direction as the rotating field?
- h) Write down the applications of open-delta connection.
- i) Why the starting torque of a capacitor start induction is motor is high?
- j) What is single phasing in a 3-phase induction motor and what are its effects on the machine?
- Q3** a) i) In a 6-pole, 50Hz, single phase induction motor, the gross power absorbed by the forward and backward fields are 160 W and 20W respectively at a motor speed of 950 r.p.m. If the no-load frictional losses are 75 W, find the shaft torque. (10)  
 ii) Explain about the different speed control technique of a single-phase induction motor.
- b) Classify the different types of losses associated with a transformer? Explain with suitable mathematical expressions. (5)
- Q4** a) i) Develop the equation for the starting torque of a 3-phase induction motor. (10)  
 ii) Draw and explain about the torque-slip characteristics of a 3-phase induction motor.
- b) Explain about the double field revolving theory with neat sketch. (5)
- Q5** a) i) Draw the phasor diagram of a single phase transformer for an inductive load. (10)  
 ii) The voltage on the secondary side of a single phase transformer is 200 Volt when supplying a load of 8 kW at a p.f. of 0.8 lagging. The secondary resistance is  $0.04\Omega$  and secondary leakage reactance is  $0.8\Omega$ . Calculate the induced e.m.f. in the secondary.
- b) What are the advantages and disadvantages of an auto transformer? (5)
- Q6** a) i) Draw and explain about the Scott (T- connection) of transformers. (10)  
 ii) Two transformers are required for a Scott connection operating from 440 volt, 3- phase supply for supplying two single-phase furnaces at 200 V on the two-phase side. If total output is 150 kVA, calculate the secondary to primary turns ratio and the winding currents of each transformers.
- b) Explain about the different types of connection of three phase transformer with suitable diagram. (5)
- Q7** a) i) Explain how a rotating magnetic field is produced from a 2- phase supply in case of a single-phase induction motor with neat sketch. (10)  
 ii) Draw and explain the equivalent circuit of a single-phase induction motor and also find the different parameters of the machine at stand still and running condition.