

(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.  
 (4) Each question is of 20 Marks.

**Q1. Answer ANY FOUR.**

- a) Illustrate OC and SC test of a single phase transformer. **05**  
 b) Compare autotransformer and two winding transformer. **05**  
 c) Describe connection and phasor diagram of Yd11 transformer. **05**  
 d) State applications of single phase induction motor. **05**  
 e) Draw and describe torque-slip characteristic of three-phase induction motor. **05**

**Q 2. Answer the following.**

- a) Draw the circle diagram for 3.73 kW, 200 V, 50 Hz, 3-phase, 4 pole star connected induction motor **10**  
 from given data  
 No load test: 200 V, 5 A, 350 W  
 Blocked rotor test: 100 V, 26 A, 1700 W  
 Rotor cu loss at standstill is half of total cu loss. From circle diagram at full load find line current, power factor, slip, efficiency, maximum torque & maximum output.  
 b) Explain construction, working, characteristics, and application of shaded pole induction motor. **10**

**Q 3. Answer the following.**

- a) Explain saving of copper in auto transformer with application. **10**  
 b) Explain Scott connection with neat diagram. **10**

**Q 4. Answer the following.**

- a) Why starter is required in 3-phase induction motor? Explain star delta starter with neat diagram. **10**  
 b) A 220 V, 4 pole, 50 Hz, split phase induction motor has the following test results. **10**

<b>Blocked Rotor Test:</b>	120 V	9.6 A	460 W
<b>No load test:</b>	220 V	4.6 A	125 W

The stator winding resistance is 1.5 ohms and during the blocked rotor test, the stator winding is open. Determine the equivalent circuit parameters. Also find core, friction and windage losses.

**Q 5. Answer the following.**

- a) Describe power stages of 3-phase induction motor with necessary expressions. **10**  
 b) Explain in detail double field revolving theory of single phase induction motor. **10**

**Q 6 Answer the following.**

- a) Enlist the different speed control methods of three phase induction motor and describe in detail Pole Changing Method. **10**  
 b) Describe switching intransient phenomenon in three phase transformer. **10**

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