(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 from given data **10**
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**

Blocked Rotor Test:	120 V	9.6 A	460 W
No load test:	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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