

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – SUMMER 2013****Subject Code: 150901****Date: 14-05-2013****Subject Name: Electrical Machine - II****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Draw and explain vector diagram, connection diagram and clock representation of Dz6 connection of 3-phase transformer. **07**
- (b)** Draw and explain vector diagram and connection diagram of Scott used for converting 3-phase supply into two 1-phase supply using two 1-phase transformer **07**
- Q.2 (a)** With the help of a neat diagram explain parallel operation of two 3-phase transformers. Also explain the essential & desirable conditions to be fulfilled for operating two 3-transformers in parallel. **07**
- (b)** Two transformers are connected in open delta and supply a balance 3-phase load of 240 KW at 400 volt and a power factor of 0.866, determine **07**
- (1) The secondary line current, (2) The KVA load on each transformer,
(3) The power delivered by the individual transformers.
- OR
- (b)** Draw and explain vector diagram, connection diagram and clock representation of Yz11 connection of 3-phase transformer. **07**
- Q.3 (a)** Draw the circle diagram for a 3-phase, 6-pole, 50hz, 400 V star connected induction motor from the following data **10**
- No load test: 400V, 9A, 1250 watt; Short circuit test: 200V, 50A, 6930 watt
The stator loss at standstill is 55% of total copper losses and full load current is 32 A. determine (1) power factor, slip, output, efficiency, speed and torque at full load
(2) starting torque
- (b)** Explain the phenomenon of cogging and crawling in induction motor. **4**
- OR
- Q.3 (a)** State and explain different speed control methods of 3-phase induction motor **07**
- (b)** Explain principle and operation of 3-phase induction generator. Also state its application. **07**
- Q.4 (a)** Explain double revolving field theory related to 1-phase induction motor. From this theory verify that 1-phase induction motor is not self started. **07**
- (b)** A 230V, 380W, 50Hz, 4-pole, 1-phase induction motor gave the following test results. **07**
- No load test : 230 V, 84 W, 2.8 A; Blocked rotor test: 110 V, 460W, 6.2A
The stator winding resistance is 4.6 ohm and during the blocked rotor test the auxiliary winding is open. Determine the equivalent circuit parameters.
- OR
- Q.4 (a)** Explain operation and principle of universal motor **07**
- (b)** Explain different methods of producing starting torque in 1-phase induction motor **07**
- Q.5 (a)** Explain construction and working principle of Schrage motor. **07**
- (b)** Explain the working, equivalent circuit and advantages of double squirrel cage induction motor. **07**
- OR
- Q.5 (a)** Explain construction and working principle of shaded pole induction motor. **07**
- (b)** Explain construction of welding transformer. How does it differ from power transformer? **07**
