Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER– II EXAMINATION – SUMMER 2015

Subject Code:X20903 **Date:05/06/2015**

Subject Name: Electrical Machine 1 and 2

Time:10.30am-01.00pm **Total Marks: 70**

Instructions:

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

Q.1 (a) Define d.c. generator and motor. Explain the types of d,c. motors with diagram. 7

(b) Explain construction and working principle of 1-phase transformer. 7

Q.2 (a) Explain the characteristics of d.c. motors with necessary diagrams. 7

(b) A 120 V, d.c. shunt motor has an armature resistance of 0.2 Ω and a field resistance of 60Ω It runs at 1800 rpm taking a full load current of 40 A. Find the speed on half load condition. 7

Q.3 (a) Why starter is use in d.c. motor? Explain three point starter in detail. 7

(b) What are the condition for parallel operation of transformers? Explain parallel operation of 1-phase transformers. 7

Q.4 (a) Explain the methods of speed control of d.c. motors. 7

(b) A d.c. shunt motor runs at a speed of 1000 rpm on no load taking a current of 6 A from the supply, when connected to 220 V d.c. supply. Its full load current is 50 A. Calculate its speed on full load. Assume Ra= 0.3 Ω and Rsh= 110 Ω. 7

Q.5 (a) Explain equivalent circuit of 1-phase transformer with its importance. 7

(b) A 6600/400 V single phase transformer has primary resistance of 2.5 Ω and secondary resistance of 0.01 Ω. Calculate total equivalent resistance referred to primary and secondary. 7

Q.6 (a) Explain construction and working of 3-phase induction motor. 7

(b) A 4 pole, 3-phase, 50 Hz, star connected induction motor has a full load slip of 4 %. Calculate full load speed of the motor and rotor emf frequency. 7

Q.7 (a) What is voltage regulation of alternator? Explain the methods to find voltage regulation of alternator. 7

(b) Explain working principle of synchronous motor. Discuss the applications of synchronous motor. 7

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