Date: 24/12/2015.

Exam No:-_____

GANPAT UNIVERSITY
B.TECH SEM-III (MECHATRONICS)
REGULAR EXAMINATION NOV-DEC-2015
2EE307:- ELECTRICAL MACHINES AND DRIVES

Time: 3 Hours **Total Marks:-60**

Instructions: - 1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Answer to two sections must be written in separate answer books.
4. Figures to the right indicate full marks.

SECTION-I

Que.-1 **(A)** Derive EMF equation for Transformer? Also define following term: **[05]**
(1) Transformation Ratio
(2) Magnetic leakage
(3) Voltage regulation

(B) What is Auto-Transformer? And Discuss about Saving of Copper in Auto Transformer? **[05]**

OR

Que.-1 **(A)** Discuss open circuit test and short circuit test carried on single phase transformer. **[07]**

(B) What is Pitch Factor & Distribution Factor? Explain in brief. **[03]**

Que.-2 **(A)** Explain principle, construction and working of Alternator. **[05]**

(B) Enlist the application of synchronous Motor and give detailed explanation of Synchronous condenser. **[05]**

OR

Que.-2 **(A)** State Conditions for parallel operation of Alternator also Explain in brief dark lamp method. **[05]**

(B) A 3,300/230-V, 50-Hz, 1-phase transformer is to be worked at a maximum flux density of 1.2 Wb/m2 in the core. The effective cross-sectional area of the transformer core is 150 cm2.Calculate suitable values of primary and secondary turns. **[05]**

Que.-3 **Attempt any two.** **[10]**

(A) A coil resistance of 500Ω is placed in mag. Field of 0.8mwb.the coli has 1050 turns & the galvanometer of 500Ω is connected in series with it. The coil is moved from given field to 0.9mwb in 0.4 sec. Find avg. induced emf & current?

(B) With the help of block diagram, explain function of each parts of drives in detail.

(C) With the help of diagram explain working of DC Servo motor.

SECTION-II

Que.-4 (A) Explain basic principle of DC generator also state the function of all parts of DC machine [05]

(B) Enlist types of DC generator and draw circuit diagram of each and every DC generator. [05]

OR

Que.-4 (A) Derive torque equation of DC motor. [05]

(B) Enlist methods for speed control of DC Shunt motor. Explain any two method in detail [05]

Que.-5 (A) Derive equation of running torque also derive condition for maximum starting torque. [05]

(B) Why single phase induction motor is not self starting? Explain capacitor start induction run method for starting of single phase induction motor. [05]

OR

Que.-5 (A) Explain variable reluctance stepper motor in detail. [05]

(B) A 4 pole 3 phase induction motor operates from a supply whose frequency is 50 Hz, Calculate: [05]

(1) The speed at which the magnetic field of the stator is rotating.

(2) The speed of rotor when slip is 0.04

(3) The frequency of rotor current at standstill.

Que.-6 **Attempt any two.** [10]

(A) What is construction and principle of repulsion motor? Explain in detail.

(B) Define Drive. Also explain group drive and multimotor drive with its advantages and disadvantages.

(C) Derive EMF equation of D.C. generator and find out generated EMF of eight pole lap wound armature having 960 conductors and flux per pole of 20 mWb. Generator driven speed at 500 RPM

END OF PAPER