

**GANPAT UNIVERSITY****B. Tech. Semester : 3<sup>rd</sup> Electronics & Communication Engineering****Regular Examination November – December 2013****2EE303 : Electrical Engineering**

Time: 3 Hours

Total Marks: 70

- Instruction:**
1. Attempt all questions.
  2. Make suitable assumptions wherever necessary.
  3. Figures to the right indicate full marks.
  4. Assume suitable data wherever necessary.

**Section – I**

- Que. – 1 (A) Explain working of transformer on Load with phasor diagram. 06
- (B) What are the types of Transformer tests? Explain short circuit test with necessary diagram. 06

OR

- Que. – 1 (A) What do you mean by equivalent circuit? Explain equivalent circuit of transformer. 05
- (B) A 2200/200V transformer draws a no-load primary current of 0.6A and absorbs 400watts. Find the magnetizing and iron loss currents. A 2200/250V transformer takes 0.5A at a p.f. of 0.3 on open circuit. Find magnetizing and working components of no-load primary current. 04
- (C) Explain losses in transformer. 03

- Que. – 2 (A) A 1100-V, 50 Hz delta connected induction motor has star connected slip rings with transformation ratio 3.8. The rotor resistance and standstill leakage reactance are  $0.012\Omega$  and  $0.25\Omega$  per phase respectively. Neglect Stator Impedance and Magnetizing Current. Determine : a. Rotor Current at start with slip ring shorted  
b. Rotor p.f. at start with slip ring shorted  
c. Rotor Current at 4% slip with slip ring shorted  
d. Rotor p.f. at 4% slip with slip ring shorted 06
- (B) Explain Torque-Slip characteristics of three phase induction motor. 05

OR

- Que. – 2 (A) Derive the equation of torque under running condition for three phase induction motor. Also derive the condition for maximum torque under running condition. 06
- (B) Explain double field revolving theory with necessary sketches. 05

- Que. – 3 (A) What are the different types of Induction motor starter? Explain star-delta starter. 06
- (B) Attempt any two 06
- a. Write a brief note about losses occur in induction motor.
  - b. Write a brief note about Armature Reaction.
  - c. Give difference between lap winding and wave winding

Section – II

- Que. – 4 (A) Derive the E.M.F. equation of lap connected D.C. generator. 05  
(B) Derive the Equations for Armature torque and Shaft torque for D.C. Motor. 07

OR

- Que. – 4 (A) A 4-pole, D.C. shunt generator with a shunt field resistance of 100 ohm and armature resistance of 1 ohm has 378 wave connected conductors in its armature. The flux per pole is 0.02 Wb. If a load resistance of 10 ohm is connected across the armature terminals and the generator is driven at 1000 r.p.m. , calculate the power absorbed by the load. 05  
(B) What do you mean by back E.M.F? Give significance of it. 03  
(C) Write a brief note about H.R.C. fuse. 04

- Que. – 5 (A) What is Armature reaction of alternator? Explain the effect of different power factors. 05  
(B) Explain the effect of change in armature current with the change in field current by using V curve. 06

OR

- Que. – 5 (A) Explain the methods of “Starting of Synchronous motor”. 05  
(B) A 3- $\Phi$ , 16 pole alternator has a star connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.03 Wb. sinusoidally distributed and the speed is 375 rpm. Find the efficiency and the phase and line emf. Assume full pitched coil. 06

- Que. – 6 **Attempt any three.** 12  
(A) Explain the principle of alternator.  
(B) What are the merits and demerit of hydro electric power plant.  
(C) Explain Distribution Factor and Winding Factor.  
(D) Derive the equation of speed and frequency of Alternators.