

GANPAT UNIVERSITY**B. TECH. SEMESTER: III (ELECTRONICS & COMMUNICATION ENGINEERING)****REGULAR EXAMINATION NOV – DEC 2015****2EE 308: ELECTRICAL ENGINEERING****Time: 3 Hours****Total Marks: 60**

- Instruction:**
1. This question paper has two sections. Attempt each section in separate answer book.
 2. Figures to the right indicates full marks.
 3. Be precise and to the point in answering the descriptive questions.

Section - I

- Que. – 1**
- (A) Discuss the different parts of D.C. Generator. 05
- (B) 4-pole, long-shunt lap-wound generator supplies 25 kW at a terminal voltage of 500 V. The armature resistance is 0.03 ohm, series field resistance is 0.04 ohm and shunt field resistance is 200 ohm. The brush drop may be taken as 1.0 V. Determine the e.m.f. generated. Calculate also the No. of conductors if the speed is 1200 r.p.m. and flux per pole is 0.02 weber. Neglect armature reaction. 03
- (C) Derive the condition for maximum efficiency in D.C. Generator. 02

OR

- Que. – 1**
- (A) Explain the characteristics of D.C. Series motor with necessary figures. 04
- (B) Determine developed torque and shaft torque of 220 V, 4 pole series motor with 800 conductors wave connected supplying a load of 8.2 kW by taking 45 A from the mains. The flux per pole is 25 mWb and its armature circuit resistance is 0.6 Ω . 03
- (C) Discuss about the losses, power stages and efficiency for DC motor. 03

- Que. – 2**
- (A) Discuss Armature Reaction of an alternator. 05
- (B) Find the synchronous impedance and reactance of an alternator in which a given field current produces an armature current of 200 A on short circuit and a generated emf of 50 V on open circuit. The armature resistance is 0.1 Ω . To what induced voltage must the alternator be excited if it is to deliver a load of 100 A at a p.f. of 0.8 lagging, with a terminal voltage of 200 V. 03
- (C) Define the following Terms: 02
- (i) Distribution Factor (ii) Coil Span Factor or pitch factor

OR

- Que. – 2**
- (A) Define Voltage regulation and explain the Synchronous impedance method of voltage regulation for alternator with necessary phasor diagrams. 05
- (B) Explain the synchronous motor on load with constant excitation. 05
- Que. – 3 Attempt any two:** 10
- (A) Discuss Three point starter.
- (B) Explain the methods of speed control for D.C. Shunt motor.
- (C) Discuss the different characteristics of D.C. Generator.

Section – II

Que. – 4 (A) Discuss open circuit and short circuit test carried out on single phase transformer. 05

(B) A 30 KVA, 2400/120 V, 50 Hz transformer has a high voltage winding resistance of 0.1 ohm and a leakage reactance of 0.22 ohm. The low voltage winding resistance is 0.035 ohm and the leakage reactance is 0.012 ohm. Find the equivalent winding resistance, reactance and impedance referred to the (1) High voltage side and (2) Low voltage side. 05

OR

Que. – 4 (A) Explain construction of single phase transformer. 05

(B) What is voltage regulation and leakage reactance? Obtain equivalent circuit of transformer. 05

Que. – 5 (A) What do you mean by slip? Derive equation for rotor speed and frequency of rotor current. 05

(B) A 4 pole 3 phase induction motor operates from a supply whose frequency is 50 Hz, Calculate Synchronous speed at which the magnetic field of the stator is rotating, rotor speed when slip is 5% and rotor current frequency if rotor speed become same as synchronous speed. 05

OR

Que. – 5 (A) Explain construction of three phase induction motor. 05

(B) Draw circuit diagram of split phase single phase induction motor and explain its working using proper vector diagram. 05

Que. – 6 Attempt any two: 10

(A) Discuss single stack and multi stack variable reluctance stepper motor.

(B) Write short note on : Transformer on no load

(C) Derive condition for maximum efficiency of transformer.

END OF PAPER