

(DEE 216)

B. Tech. DEGREE EXAMINATION, MAY - 2015

(Examination at the end of Second Year)

ELECTRICALS AND ELECTRONICS

Paper - VI : Electro Mechanics - I

Time : 3 Hours

Maximum Marks : 75

Answer question No. 1 compulsory

(15)

Answer ONE question from each unit

(4 x 15 = 60)

- 1) a) Define law of energy conservation.
- b) Write the energy balance equation DC generators.
- c) Which type of magnets are used in DC machines? Why?
- d) What are essential things to generate EMF in DC generators?
- e) Explain Fleming right hand rule.
- f) Define Armature Reaction.
- g) Write the types of DC Generators.
- h) How torque developed in DC motors.
- i) Write any two differences between DC generator and DC motor.
- j) What is importance of Starter?
- k) Write the applications of DC Shunt motor.
- l) Draw the equivalent circuit diagram for DC Compound motor.
- m) How to reduce constant losses and mechanical losses.
- n) The generator efficiency is more comparing to motor. Why?
- o) Define Metadyne.

Unit – I

- 2) a) Explain the principle of energy conversion.
- b) With neat relevant diagram derive the expression for mechanical force of a singly excited system when it is controlled by current.

OR

- 3) Derive an expression for the magnetic force developed in a multi excited magnetic field system.

Unit – II

- 4) a) Derive the expression for the voltage induced in a DC generator.
- b) A six pole lap wound DC generator armature has 720 conductors, a flux of 30mwb and running at a speed of 600rpm. Calculate the e.m.f. generated on open circuit. If the same armature is wave wound, at what speed it is to be driven to generate 600volts?

OR

- 5) a) Explain the principle of operation of a DC motor.
- b) A series motor takes 20 A at 400 V and runs at 250 rpm. The armature resistance is 0.6 ohms and field resistance is 0.4 ohms. The torque required by the device varies as the square of the speed. Find the applied voltage on the current to run the devices at 350 rpm.

Unit – III

- 6) Discuss the need for parallel operation of generators. Explain the load sharing of DC shunt generators operating in parallel.

OR

- 7) Two DC generators, each having linear external characteristics, are operating in parallel and supply a total load current of 160 A. The terminal potential difference of one machine falls from 240 V on no load to 220 V when its current output is 100A. The terminal potential difference of the other machine falls from 240 V to 216 V when its armature current is 80 A. Determine :
- a) Current supplied by each machine.
- b) Terminal voltage.

Unit – IV

- 8) a) Discuss the various losses in dc machine in detail.
- b) A DC Shunt motor is running with 220V DC supply and 11.6A. The Copper losses and iron losses are 300W and 100W respectively. Calculate the efficiency for

i) Full load

ii) Half load

OR

9) Write short notes on the following :

a) Field Test

b) Principle and operation of Rosenberg generator.

