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B.E. DEGREE EXAMINATION, NOV/DEC – 2011
IV SEMESTER
ELECTRICAL AND ELECTRONICS ENGINEERING
EE 9253 ELECTRICAL MACHINES I

Time: 3 Hours

Max. Marks: 100

Answer all questions

PART- A (10 X 2 = 20)

1. Define: All day efficiency of a transformer.
2. What will happen if the field winding of a DC motor suddenly gets opened during running condition?
3. List the applications of DC motors.
4. What do you mean by concentrated winding and distributed winding?
5. Draw the OCC of a self excited DC generator.
6. DC series motor should only be started with load. Why?
7. What will happen to a transformer when it is given high DC voltage?
8. State the losses occurring in transformer. How to reduce it?
9. Why is starter needed for a motor?
10. Explain the phenomenon of back emf in DC motor.

PART- B (5 X 16 = 80)

11. (i) Discuss about a magnetic system and their different relationships for a core without air-gap and with air gap.

(ii) Explain about Hysteresis and Eddy current losses.

12 (a) Derive the EMF equation of a single phase transformer and explain the no-load condition of a single phase transformer with phasor diagram.

(OR)

12(b) Write notes on (i) Auto transformer (ii) Three phase transformer

13 (a) Derive the EMF equation of a DC generator and the torque equation of a DC motor.

(OR)

13 (b) (i) A 20 kW, 200 V shunt generator has an armature resistance of 0.05 ohms and a shunt field resistance of 200 ohms. Calculate the power developed in the armature when it delivers rated output.

(ii) A 250 V DC shunt motor takes 30 A current while running at full load. The resistance of motor armature and field windings are 0.1 ohms and 200 ohms respectively. Determine the back emf generated in the motor, when it runs on full load.

14 (a) Draw the developed diagram and explain the two different types of armature windings that are commonly used for DC machines.

(OR)

14 (b) Explain the construction and working principle of a DC generator with neat diagrams.

15(a) Explain with circuit diagrams to classify the DC motors. Draw the Characteristics of these motors

(OR)

15 (b) State and explain the various speed control and testing methods of DC motors with circuit diagrams.
