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B.E. DEGREE EXAMINATION, APR/MAY – 2019
IV SEMESTER
ELECTRICAL AND ELECTRONICS ENGINEERING
EE8403 ELECTRICAL MACHINES - I
(R2012)

Time: 3 Hours

Max. Marks: 100

Answer all questions

PART- A (10 X 2 = 20)



1. What is meant by leakage flux?
2. List the analogy between Electric and Magnetic circuits.
3. Draw a symmetrical hysteresis loop.
4. Define Lenz law
5. List the thermal classification of electrical insulating materials.
6. How do we calculate the efficiency of the machine?
7. Why do you have more losses in a motor than a transformer?
8. What do you mean by commutation in DC motor?
9. How do we rate transformer? Why?
10. What is per unit system?

PART- B (5 X 16 = 80)

11. Describe the AC operation and DC operation of magnetic circuits with neat diagrams.

12 (a) What are the basic aspects of Electromechanical Energy converters?
Explain it in detail.

(OR)

12 (b) Describe the singly excited and multiply excited magnetic field systems and derive the expression for electromagnetic torque.

13 (a) A 220 V DC shunt motor draws a current of 2 A on no-load. Armature resistance is 0.2 ohms and field current is 1 A. Find the output and efficiency when the input current is 12 A.

(OR)

13(b) Derive the emf equation and torque equation of a DC machine.

14 (a) Explain the construction and the principle of operation a DC machine and describe how it runs as a generator as well as a motor.

(OR)

14 (b) A shunt generator running at 500 rpm delivers 50 kW at 200 V. The armature and field resistances are 0.02 ohms and 40 ohms respectively. Calculate the speed when the machine is running as a shunt motor and drawing 50 kW from a 200 V source

15(a) Draw the equivalent circuit of a single phase transformer and explain how we find its parameters.

(OR)

15 (b) Explain the construction and working principle of a single phase ideal transformer on no load and load with phasor diagrams.

