Reg. No. : | | | | | | | | | | |

Question Paper Code: 31032

B.E. / B.Tech. DEGREE EXAMINATION, OCTOBER 2014.

Third Semester

Electrical and Electronics Engineering

01UEE302 - DC MACHINES AND TRANSFORMERS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Give the formula for mechanical force with respect to magnetic systems.
2. How will you calculate the magneto motive force (mmf) at any slot in an electrical machine?
3. State any two effects of armature reaction in a DC machine.
4. Define Commutation.
5. State the various types of DC Motors.
6. Draw the basic arrangement of a DC Starter.
7. State the properties of Ideal transformer.
8. What are the various losses in a transformer?
9. What are the various methods of testing a DC machine?
10. What is the condition for maximum efficiency in a DC machine?

PART - B (5 x 16 = 80 Marks)

11. (a) Explain the concepts and equations involved in deriving expressions for field energy and co-energy in magnetic systems. (16)

Or

(b) (i) Derive an expression for Torque in wound rotor machine. (8)

(ii) Distinguish between statically and dynamically induced emf. (8)

12. (a) (i) Derive an expression for EMF equation of DC Generator. (10)

(ii) Compare Lap and Wave winding. (6)

Or

(b) Explain the following:

(i) Compensating winding (6)

(ii) Load characteristics of DC Shunt generator (6)

(iii) Applications of various types of DC Generators. (4)

13. (a) (i) State the significance of Back EMF in a DC motor. (6)

(ii) Explain the various characteristics of DC shunt motor. (10)

Or

(b) (i) Derive the Torque equation of a DC Motor. (8)

(ii) Draw and explain the operation of Three point Starter. (8)

14. (a) (i) Draw and explain the phasor diagram of Transformer on NO LOAD. (8)

(ii) A 250 KVA single phase transformer has iron loss of 1.8 kW. The full load copper loss is 2000 W. Calculate the efficiency at full load, 0.8 power factor lag. (8)

Or

(b) (i) Derive the equivalent circuit of a single phase transformer. (10)

(ii) State the conditions that must be followed for satisfactory parallel operation of transformer. (6)

15. (a) Describe the Hopkinson's Test in detail with its merits and demerits. (16)

Or

(b) Explain the Sumpner's test to determine efficiency and regulation of transformer. (16)
