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

Question Paper Code: 50332

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Third Semester

Electrical and Electronics Engineering

15UEE302 - DC MACHINES AND TRANSFORMERS

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The relative permeability of a ferromagnetic material is

   (a) less than one (b) more than one
   (c) more than 10 (d) more than 100 or 1000

2. Laminated cores, in electrical machines are used to reduce

   (a) Copper loss (b) eddy current loss
   (c) Hysteresis loss (d) all the above

3. The path of magnetic flux in a transformer should have

   (a) high resistance (b) high reluctance
   (c) low resistance (d) low reluctance

4. Star-Star transformers works satisfactorily when

   (a) Load is unbalanced only (b) load is balanced only
   (c) On balanced (d) none of these

5. Electromagnetic torque in rotating electrical machinery is present when

   (a) air gap is uniform (b) stator winding alone carries current
   (c) rotor winding alone carries (d) both stator and rotor carries current

6. Singly and doubly excited magnetic systems are respectively

(a) loud speakers
(b) synchronous motors and moving iron motors
(c) dc shunt machines
(d) reluctance motors and synchronous motors

7. The basic requirement of a d.c armature winding is that it must be

(a) a closed one
(b) a lap winding
(c) a wave winding
(d) either (b) or (c)

8. The external characteristics of a shunt generator can be obtained directly from its

(a) internal characteristics
(b) open circuit characteristics
(c) load characteristics
(d) none of these

9. The maximum torque of dc motor is limited by

(a) commutation
(b) heating
(c) speed
(d) armature current

10. Retardation test of d.c shunt motor is used for finding

(a) stray losses
(b) copper losses
(c) friction losses
(d) iron losses

PART - B (5 x 2 = 10 Marks)

11. Define magnetic reluctance.

12. What are the typical uses of auto transformer?

13. Draw the graphical relation between field energy and co energy?

14. What is meant by armature reaction?

15. Mention some of the applications of d.c series motor.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain clearly the statically and dynamically induced emf. (16)

Or

(b) Explain the operation of a magnetic circuit when A.C current is applied to the coil wound on iron core. Draw the B.H curve and obtain an expression for hysteresis loss. (16)

17. (a) Derive the EMF equation of transformer. (16)

Or

(b) Explain in detail the various types of three phase transformer. (16)

18. (a) Derive the expression for field energy produced in a doubly excited magnetic field system. (16)

Or

(b) Explain the various concepts of magnetic fields in rotating machines. (16)

19. (a) Derive an expression for emf generated in DC machine. (16)

Or

(b) With neat diagrams, describe the phenomenon of armature reaction in a DC machine. Discuss its effects. (16)

20. (a) Explain the different methods of speed control of dc shunt motor with neat circuit diagram. (16)

Or

(b) With the help of a neat circuit diagram, explain the procedure for finding the efficiency of DC motor at different loads using Swinburne's test. (16)

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