Reg. No. :

Question Paper Code: 41332

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

Third Semester

Electrical and Electronics Engineering

14UEE302 - DC MACHINES AND TRANSFORMERS

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The principle of dynamically induced emf is utilised in

    (a)) Choke   (b) Transformer
    (c) Generator   (d) Thermocouple

2. Hysteresis loss can be minimised by selecting a magnetic material having

    (a) large B/H loop area   (b) High resistivity
    (c) High retentivity   (d) Low hysteresis coefficient

3. Which generator has poorest voltage regulation?

    (a) Series   (b) Shunt
    (c) Long shunt compound   (d) Short shunt compound

4. Interpole winding is connected in

    (a) Series with armature   (b) Series with main poles
    (c) Parallel with armature   (d) Parallel with main poles

5. The mechanical power is developed by a dc motor is maximum when back emf is

    (a) equal to supply voltage   (b) half of the supply voltage
    (c) doubles the supply voltage   (d) all the above

6. The direction of rotation of conductors of a DC motor can be determined by

    (a) Ampere law   (b) Fleming's left hand rule

    (c) Fleming's right hand rule   (d) Lenz's law

7. If a transformer primary is energised from a square wave voltage source, its output voltage will be

    (a) Square wave   (b) Sine wave

    (c) Pulse wave   (d) Triangular wave

8. Transformer action requires a

    (a) Constant magnetic flux   (b) Increasing magnetic flux

    (c) Alternating magnetic flux   (d) Alternating electric flux

9. Swinburne's test can be performed at

    (a) Any load   (b) Only no load

    (c) Only full load   (d) Only half load

10. The open circuit test is carried out in a transformer to find the

    (a) Cu loss   (b) Core loss

    (c) Total loss   (d) Insulation resistance

PART - B (5 x 2 = 10 Marks)

11. What is co-energy? What is it's use?

12. What are cumulative and differential compound generators?

13. Write the torque equation of a dc motor.

14. Compare core and shell type transformers.

15. Draw the circuit diagram of polarity test on transformer.

PART - C (5 x 16 = 80 Marks)

16. (a) Derive an expression for mechanical force developed by magnetic field.   (16)

Or

   (b) Derive the torque equation in round rotor machines.   (16)

17. (a) Explain with a neat sketch, the construction of a dc machine.   (16)

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Or

(b) Discuss the various effects of armature reaction in a dc machine and explain how the effect can be neutralized. (16)

18. (a) Sketch and explain the speed-current, speed-torque and torque-current characteristics of a shunt motor, series motor and compound motor. (16)

Or

(b) Explain the different methods used for the speed control of dc shunt motor. (16)

19. (a) Draw the no-load phasor diagram of a transformer and explain. (16)

Or

(b) Enumerate the various losses in a transformer. How these losses can be minimized. (16)

20. (a) Explain Swinburne's test for predetermining the efficiency of a dc machine. (16)

Or

(b) Explain the Open circuit and short circuit on transformer. (16)

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