Register Number: ……..

B.E DEGREE EXAMINATIONS: APRIL/MAY 2014

(Regulation 2009)

Third Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

EEE103: Electrical Machines I

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The field coil of DC generator is made of
   a) mica b) copper
   c) Cast iron d) carbon
2. The voltmeter connected across a generator reads voltage same at no-load and at full load. The generator is of the type
   a) Shunt generator b) Series generator
   c) Level compound d) Short shunt compound.
3. Which of the statement associated with DC series motor is correct
   a) It has poor torque. b) It gives almost constant speed.
   c) Its field winding consists of few turns of thick wire. d) It may run away if its field get open.
4. The commutator of a DC motor serves the purpose of
   a) Changing ac to dc b) Converting ac to dc
   c) Reducing fricition d) Avoiding arc at the brushes
5. In Swineburne's test of DC machines
   a) No- load losses are calculated and copper losses are measured. b) No-load losses are measured and copper losses are calculated.
   c) Both the No- load losses and copper losses are measured. d) Both the No- load losses and copper losses are calculated.
6. In a transformer electrical power is transferred from primary to secondary
   a) Through air b) By magnetic flux
   c) Through insulating medium d) By conductors in the windings.
7. If rated dc voltage is applied instead of rated ac to the primary of a transformer
   a) Primary of the transformer will burn. b) Secondary voltage will be excessively high.
   c) Secondary of the transformer will burn. d) There will be no secondary voltage.

8. The phasor diagram of a transformer on on load can be drawn only if we know
   a) Equivalent circuit parameters of the transformer b) Load current
   c) Load power factor d) All the above condition.
9. The transformer efficiency , under heavy load is comparatively low due to
   a) Large increase in copper losses in comparison to the output. b) Large increase in iron losses
   c) Drop in power factor. d) None of the above.
10. Two transformer operating in parallel will share the load depending upon their
    a) Ratings. b) Leakage reactance.
    c) Efficiency. d) Per unit impedance.

PART B (10 x 2 = 20 Marks)

11. Why pole shoes and pole faces are always laminated?
12. What is the reason for DC shunt generator to fail in building up Voltage?
13. What is the reason of high current been drawn by dc motor at the time of starting?
14. State any two application's of DC compound motor.
15. Why direct method of determination of efficiency is not preferred in case of medium and large dc machine?
16. Explain the concept of Brake test in testing of DC machines.
17. What is a transformer?
18. What is the phase displacement between primary and secondary voltages for a Δ-Y, 3- phase transformer?
19. Why in a transformer open-circuit test is conducted on low voltage side while short-circuit test is conducted on high voltage side?
20. Why the efficiency and regulation of a 3- winding ideal transformer is 100 %?

PART C (5 x 14 = 70 Marks)

21. a) With neat sketch explain the principle operation of DC generator and derive the EMF equation.

(OR)

b) Explain with neat sketch the concept of armature reaction and commutation in DC generator.

22. a) Derive the torque equation of a DC motor and with reference to this equation (torque vs output) explain the characteristics of all the types of DC Motors.

(OR)

b) (i) Explain why speed control methods are applicable to a certain type of DC motor with mathematical reasoning. (7)

(ii) State the application of different types of DC motor. (7)

23. a) With neat sketch explain the principle of brake test conducted on DC machines. Explain the procedure in details to conduct it.

(OR)

b) Why Swinburne's test is conducted on a DC machines? State all the mathematical equation involved in conducting this test.

24. a) Write brief notes on the different types of connection of three phase transformer windings with the relation of primary and secondary voltages and also their applications.

(OR)

b) Derive the emf equation of single phase transformer and state the difference of it with respect to Auto transformer.

25. a) Explain in details what all types of test will be conducted on a transformer to draw its equivalent circuit. Represent the equivalent circuit with respect to the secondary voltage if transformation ration is 'k'.

(OR)

b) Explain in details Sumpner's test on transformer and what is advantage of conducting it?

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