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4th Sem / Branch : Elect. GE, Power Station Engg, Elect. & Eltx. Engg., Fire Tech, & Safety

Subject:- Electrical Machines I

Time : 3Hrs. M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 In a transformer electrical power is transferred without change in
- a) Voltage b) Frequency
- c) Current d) All of above

Q.2 The core of transformer is laminated to
- a) To avoid hysteresis loss
- b) Because its difficult to fabricate solid core
- c) To provide high flux density
- d) To reduce eddy current losses

Q.3 The oil most commonly used in transformer is
- a) vegetable b) Mobil oil
- c) Mineral d) Water

Q.4 The function of breather in a transformer is
- a) to provide cooling air
- b) to prevent flow of moisture from outside air
- c) to provide oxygen to cooling oil
- d) to filter transformer oil

Q.5 In a dc machine angle between stator and rotor fields in degrees is
- a) 0 b) 45
- c) 90 d) 180

Q.6 Fleming's right hand rule may be applied to electric generator to find
- a) Direction of rotor rotation
- b) Direction of induced emf
- c) Direction of magnetic field
- d) None of these

Q.7 The efficiency of transformer will be maximum when variable loss is equal to
- a) Eddy current loss b) Hysterisis loss
- c) Constant loss d) Copper loss

Q.8 The commutator of DC machine is made of
- a) Carbon b) Stainless steel
- c) Hard Drawn Copper d) Tungsten

Q.9 Power transformers are designed to have maximum efficiency
- a) Near full load
- b) Near 45% of full load
- c) At 50% of full load
- d) Between 50%-75% of full load

Q.10 In a step up transformer
- a) The number of primary turns are less than secondary turns
- b) Primary turns are more than secondary turns
- c) Equal number of turns
- d) None

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 A transformer works on the principle of _____ induction.

Q.12 For step up transformer, transformation ratio is _____ than unity.
Q.13 Transformer core is made of silicon steel to _____.
Q.14 _____ winding is placed near the core.
Q.15 For parallel operation of two transformers they must have _____ phase sequence.
Q.16 The brushes of DC machines are made of _____.
Q.17 A 4 Pole wave wound motor will have _____ parallel paths.
Q.18 DC Series motors are used where _____ starting torque is required.
Q.19 A DC shunt motor may be considered as a _____ speed motor.
Q.20 In generator terminal voltage is _____ than emf induced in armature winding.

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Explain what happens to the transformer if DC supply is given.
Q.22 Explain the difference between core and shell type transformer.
Q.23 Explain the concept of voltage regulation in transformer with its expression.
Q.24 Explain open circuit test of a transformer for determining core losses.
Q.25 Explain the function of a no load current in a transformer.
Q.26 What is Autotransformer? Explain its working principle.

Q.27 Explain the concept of Back EMF for DC generator & motor.
Q.28 Derive and explain the factors on which Torque developed in DC machine depends.
Q.29 Explain the working of interpoles with their location for improving commutation in DC machines.
Q.30 Explain various types of losses in a transformer.
Q.31 Draw Torques is Current curve for a DC Series motor and explain why it is used for traction load.
Q.32 How speed of a DC Motor can be reversed by drawing circuit diagram?
Q.33 Explain the concept of plugging for braking in DC motors.
Q.34 Draw and explain the phasor diagram of a transformer for inductive load.
Q.35 Explain the concept of mutual flux and leakage flux in transformer with their importance.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 Explain the construction of DC Machine with functions of various parts.
Q.37 Draw equivalent circuit for different types of DC motors and derive relationships between armature voltage and Back EMF.
Q.38 Explain different types of three phase transformer connections.