



- (B) DC, AC
- (C) Fixed AC, Variable AC
- (D) Fixed DC, Variable DC
- g) Effect of armature field on main field is known as.....
  - (A) Magnetizing characteristic
  - (B) Armature reaction
  - (C) de-magnetizing characteristic
  - (D) None of above
- h) The constant losses in transformer is/are
  - (A) copper loss.
  - (B) eddy current loss.
  - (C) hysteresis loss.
  - (D) both 2 and 3
- i) A DC generator works on the principle of
  - (A) Lenz's Law
  - (B) Ohm's Law
  - (C) Faraday's law of electromagnetic induction
  - (D) None of the above
- j) In a 3-phase induction motor, the rotor field rotates at synchronous speed with respect to
  - (A) stator
  - (B) rotor
  - (C) stator flux
  - (D) none of the above
- k) Give name of different test on transformer.
- l) Explain the function of yoke.
- m) Explain the function of commutator.
- n) How may the direction of rotation of a d.c. motor be reversed?

**Attempt any four questions from Q-2 to Q-8**

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|------------|---|-------------|
| <b>Q-2</b> | <b>Attempt all questions</b>  | <b>(14)</b> |
| (a)        | Explain different types of D.C. generator.  | (7)         |
| (b)        | Explain in detail armature reaction in dc machines.   | (7)         |
| <b>Q-3</b> | <b>Attempt all questions</b>  | <b>(14)</b> |
| (a)        | Derive the E.M.F equation for Simplex lap and wave wound generator.   | (7)         |
| (b)        | Explain the speed control of D.C. Shunt Motor.  | (7)         |
| <b>Q-4</b> | <b>Attempt all questions</b>  | <b>(14)</b> |
| (a)        | Explain the need of parallel operation of Transformer. What are the conditions of parallel operation of Transformers? | (7)         |
| (b)        | Derive emf equation of single phase transformer.  | (7)         |
| <b>Q-5</b> | <b>Attempt all questions</b>  | <b>(14)</b> |
| (a)        | Explain open circuit and short circuit test on transformer with suitable diagram.                                     | (7)         |
| (b)        | Explain the equivalent circuit of transformer with neat diagram.  | (7)         |



- Q-6**                    **Attempt all questions**                    **(14)**
- (a)        A short-shunt compound generator delivers a load current of 30A at 220V, and has armature, series-field and shunt-field resistances of  $0.05 \Omega$ ,  $0.30 \Omega$  and  $200 \Omega$  respectively. Calculate the induced e.m.f. and the armature current. Allow 1.0 V per brush for contact drop.                    **(7)**
- (b)        Explain different types of losses in DC machines.                    **(7)**
- Q-7**                    **Attempt all questions**                    **(14)**
- (a)        A 30kVA, 2400/120 V, 50 Hz transformer has a high voltage winding resistance of  $0.1 \Omega$  and a leakage reactance of  $0.22\Omega$ . The low voltage winding resistance is  $0.035\Omega$  and the leakage reactance is  $0.012\Omega$ . Find the equivalent winding resistance, reactance and impedance referred to the (i) high voltage side and (ii) the low voltage side.                    **(7)**
- (b)        Explain the condition for maximum efficiency of transformer.                    **(7)**
- Q-8**                    **Attempt all questions**                    **(14)**
- (a)        Explain construction of three phase induction motor.                    **(7)**
- (b)        Define the term “slip” of induction motor. Draw and explain the torque-slip characteristics of a three phase induction motor.                    **(7)**

