[85] SARDAR PATEL UNIVERSITY V.V.NAGAR
B.Sc.(III SEM.) INSTRUMENTATION (V)
5th JANUARY-2021 EXAMINATION
SUBJECT- ELECTRICAL INSTRUMENT AND POWER ELECTRONICS-I
SUB.CODE-US03CINV21

TIME: 2:00 pm to 4:00 pm   **MARKS-70**

Q-1   Choose correct answer.   [10]

1. When AC supply is given to the transformer the flux will depends on _____.
    (A) Frequency   (C) both (A) and (B)
    (B) Voltage   (D) None of above

2. The difference between the synchronous speed and actual speed of an
    induction motor is known as_____.
    (A) split   (C) shaft torque
    (B) slip   (D) None of above

3. _____ is to facilitate collection of current from the armature conductor.
    (A) Yoke   (C) Slip
    (B) Commutator   (D) None of above

4. _____ Winding is used for HIGH voltage and LOW current in machine .
    (A) Wave   (C) pole coil
    (B) Lap   (D) None of above

5. ____is a machine which converts mechanical energy in to electrical energy.
    (A) Transformer   (C) Generator
    (B) Motor   (D) None of above

6. DC machine is _____.
    (A) Induction machine   (C) both(A) and (B)
    (B) Conduction machine   (D) None of above

7. _____ Core coil mainly used in Transformer.
    (A) Iron   (C) Air
    (B) Ferrite   (D) None of above

8. In hysteresis loop flux density (B) and magnetising force (H) never attain
    _____ value simultaneously.
    (A) zero   (C) same
    (B) one   (D) None of above

9. Which of the following losses varies with load in transformer?
    (A) copper loss   (C) iron core
    (B) ferrite loss   (D) None of above

10. On what factors the speed of dc motor depends?
    (A) Applied voltage   (C) armature current
    (B) field flux   (D) All of above

Q-2   Filling the black and true /false   [08]

1   Motor efficiency is given by the ratio of _____ developed by the armature to
    its input.

2   _____ Connection is most economical for small, high voltage transformer.

3   The magnitude of the induced emf is equal to the rate of change of_____.

4   In two phase, production of rotating field that the magnitude of resultant flux
    is constant and is equal to _____.

True or False

5   In lap wound armature simplex winding has parallel path(A) = Number of
     pole(P)
6   The armature of a DC motor is laminated to reduce is eddy current loss.
7   The rotor circuit of an induction motor under operating condition is always
     closed.
8   Transformer is use to convert AC supply to DC supply.

Q-2   **Short answer type question. (Any Ten)**   [20]
1.   Briefly explain principle of working transformer.
2.   Briefly explain voltage transformation ratio of a transformer.
3.   Derive an expression voltage equation of a DC Motor.
4.   Explain principle of induction motor.
5.   Briefly explain total losses in D.C generator.
6.   List advantage of AC induction motor.
7.   List magnetic hysteresis application.
8.   List different methods of speed control induction motor.
9.   Briefly pole shoes and pole core.
10.   Briefly explain significant of back emf.
11.   Briefly explain split ring of D.C generator.
12.   A 4-pole, 3 phase induction motor operates from a supply whose frequency is
      50 Hz. Calculate the speed at which the magnetic field of the stator is rotating
      (Ns).

Q.4   **Long answer type Question.(Any Four)**   [32]
1   State faraday's laws of electromagnetic induction and explain it in detail.
2   Discuss principle of working and construction transformer and explain core
      type transformer in detail.
3   List practical loop generator parts and explain it in detail with necessary.
4   Explain in detail simple loop generator with necessary figure.
5   Derive an expression for speed of series and shunt connected D.C Motor.
6   Derive an equation for armature Torque with series and shunt connected DC
      motor.
7   Draw two phase supply production of rotating field in AC induction motor and
      explain it.
8   Explain stroboscopic method of measurement of slip.

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[2]