

(A-25)

SEAT No. _____

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SARDAR PATEL UNIVERSITY

B.Sc.(IIIrd SEM.) INSTRUMENTATION (Voc.) (NC) (2018)

27th NOVEMBER-2018 EXAMINATION(NC)

SUBJECT- ELECTRICAL INSTRUMENT AND POWER ELECTRONICS-I

SUB.CODE-US03CINV01

TIME: 2:00 pm to 5:00 pm

MARKS-70

Q-1 Choose correct answer.

[10]

1. The alloyed sheet steel material is used for _____.
(A) armature (C) both (A) & (B)
(B) transformer (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. _____ carries the magnetic flux produced by poles.
(A) Yoke (C) Armature
(B) Commutator (D) None of above
4. _____ Winding is used for high voltage and low current in machine
(A) Wave (C) Lap
(B) Pole coil (D) None of above
5. _____ is a machine which converts mechanical energy in to electrical energy.
(A) Power supply (C) Generator
(B) Motor (D) None of above
6. _____ Connection is most economical for small, high voltage transformer.
(A) Star/ Star (C) Why/Delta
(B) Delta/Delta (D) None of above
7. Motor efficiency is given by the ratio of _____ developed by the armature to its input.
(A) Current (C) Power
(B) Voltage (D) None of above
8. In an induction motor, the air gap is _____ power factor will reduce.
(A) increased (C) remain constant
(B) decreased (D) None of above
9. _____ Core coil mainly used in Transformer.
(A) Iron (C) Ferrite
(B) Air (D) None of above
10. Area of hysteresis loop represents the energy spends in taking the iron bar through _____ cycle of magnetisation.
(A) One (C) Two
(B) Three (D) None of above

Q-2 Short answer type question. (any ten)

[20]

1. Write a principle of working transformer and briefly explain it.
2. Briefly explain total losses in D.C generator.
3. List advantage and disadvantage of AC induction motor.
4. List magnetic hysteresis application.
5. Differentiate wave winding and lap winding.
6. Briefly explain general principle of induction motor.
7. Why split ring is used in dc generator in place of slip ring?
8. Briefly explain slip used in induction motor.
9. What is pole shoes and pole core?
10. Briefly explain significant of back emf.
11. Differentiate core and shell type transformer.
12. Derive an expression voltage equation of a DC Motor.

①

(P.T.O)

- Q.3(A) Discuss core type transformer with necessary figure. [06]
 Q.3(B) Derive an expression of voltage transformation ratio of a transformer. [04]

OR

- Q.3(A) State faraday's laws of electromagnetic induction and explain it in detail. [06]
 Q.3(B) Explain magnetic hysteresis with necessary figure. [04]

- Q.4 Explain practical loop generator parts; [10]
 (a) Yoke (b) Armature core (c) Commutator (d) Brushes and Bearings

OR

- Q.4 Explain simple loop generator with necessary figure. [10]

- Q.5(A) Derive an equation for armature Torque $T_a = 9.55 E_b \times I_a / N$ Of a motor. [06]
 Q.5(B) A dc motor takes an armature current of 110 A at 480 V. The armature circuit resistance is 0.2 ohm. The machine has 6 poles and the armature is lap-connected with 864 conductors. The flux per pole is 0.05 Wb. [04]
 Calculate: (a) the speed (b) the gross torque developed by the armature.

OR

- Q.5(A) Derive an expression for speed of series and shunt connected D.C Motor. [05]
 Q.5(B) Discuss comparison of Generation and Motor action with necessary figure. [05]

- Q.6 Write a note on measurement of slip. [10]

OR

- Q.6(A) Draw two phase supply production of rotating field in AC induction motor and explain it. [06]
 Q.6(B) Explain Rotor rheostat control for speed control of induction motor. [04]

