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**Question Paper Code: 43323**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

Third Semester

Electronics and Communication Engineering

14UEE323 - ELECTRICAL MACHINES

(Common to Instrumentation and Control Engineering and Mechanical Engineering)

(Regulation 2014)

Duration: Threehours                                              Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Commutators in DC machines have a role of which converts

    (a) AC to DC                               (b) both AC to DC and DC to AC
    (c) high voltage DC to low voltage DC      (d) none of these

2. In DC generator, lap winding is used in

    (a) High current and low voltage applications
    (b) High voltage and low current applications
    (c) Where constant speed is required
    (d) Where greater load is connected

3. If $V_1=E_1$ and $V_2=E_2$ then the transformer is said to be

    (a) a step up transformer                  (b) an Ideal transformer
    (c) an auto transformer                     (d) a step down transformer

4. Transformer are rated in KVA instead of KW because of

    (a) Load power factor is not known
    (b) KVA is fixed whereas KW depends on load power factor
    (c) Total transformer loss depends on VA
    (d) None of these

5. In a 3 - Φ induction motor, the maximum torque is

    (a) Varies as rotor resistance
    (b) Varies as the square of rotor resistance
    (c) Varies inversely as rotor resistance
    (d) Independent rotor resistance

6. In an induction motor, what is the ratio of copper loss and rotor input?

    (a) S            (b) (1 - S)            (c) 1/S            (d) S/(1 - S)

7. What is the frequency of a alternator, if P = number of poles and N = revolution made per second?

    (a) PN / 2 Hz       (b) 120 / PN Hz       (c) 120N / P Hz       (d) 120P / N Hz

8. In alternator, the rotary part is

    (a) Armature                             (b) Core
    (c) Magnetic field poles           (d) None of these

9. Type of single phase motor having highest power factor at full load is

    (a) shaded pole type                 (b) capacitor start
    (c) capacitor run                     (d) split phase

10. The motor which can produce uniform torque from standstill to synchronous speeds is

    (a) Universal motor               (b) Stepper motor
    (c) Reluctance motor             (d) Hysteresis motor

PART - B (5 x 2 = 10 Marks)

11. Why dc series motor should never be started on no load?

12. Define all day efficiency.

13. Define slip of a three phase induction motor.

14. Compare salient pole rotor and cylindrical rotor of a synchronous generator.

15. Which type of 1-phase induction motor would be used for Ceiling fan and Wet grinder?

PART - C (5 x 16 = 80 Marks)

16. (a) Draw the performance characteristics of different types of dc generators and explain them briefly. (16)

Or

   (b) An 8-pole DC shunt generator has 778 wave-connected armature conductors running at 500 *rpm*, supplies a load of 12.5 *ohm* resistance at a terminal volta of 250 *V*. The armature resistance is 0.24 *ohm* and the field resistance is 250 *ohm*. Find out the armature current, the induced EMF and the flux per pole. (16)

17. (a) Derive the EMF equation of a transformer. (16)

Or

   (b) Draw the equivalent circuit of a transformer and derive the components with respect to primary and secondary side. (16)

18. (a) Draw and explain the equivalent circuit of 3 phase induction motor. (16)

Or

   (b) Discuss the various starting methods of 3 phase induction motors. (16)

19. (a) Discuss about the various starting methods of synchronous motor. . (16)

Or

   (b) Explain the procedure to obtain the V and inverted V curves of a synchronous motor. (16)

20. (a) Explain the construction and working principle of switched reluctance motor with diagrams. (16)

Or

   (b) Draw the constructional diagram of the stepper motor. Explain its different modes of working. (16)

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