Reg. No. :

Question Paper Code: 43323

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 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. A series motor is efficiently suitable for

    (a) High starting torque operation   (b) Low starting torque operation
    (c) Constant speed operation   (d) None of these

2. 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

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. The short circuit test on a transformer is conducted to obtain

    (a) Copper losses   (b) Core loses only
    (c) Eddy current loss   (d) Hysteresis loss

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 electric motor used in domestic mixers is

    (a) Universal motor   (b) Shaded pole motor
    (c) Capacitor starts motor   (d) Hysteresis motor

PART - B (5 x 2 = 10 Marks)

11. A DC shunt motor is connected to a 3-point starter. What would happen if the field circuit becomes open-circuited with the motor running at no load?

12. Define all day efficiency.

13. Define slip of a three phase induction motor.

14. Mention the reasons if a 3-phase synchronous motor fails to start.

15. Is single phase induction motor self starting? Why?

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the performance characteristics of different types of dc generators. (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) Describe the construction and operating principle of single phase 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) Derive the equation for torque at running condition and the condition for maximum torque. (16)

Or

(b) With neat sketch, explain the principle and construction of 3 phase induction motors. (16)

19. (a) Explain the constructional details of three phase alternator with neat sketch. (16)

Or

(b) (i) Discuss about the various starting methods of synchronous motor. (8)

(ii) Explain the procedure to obtain the V and inverted V curves of a synchronous motor. (8)

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

Or

(b) Describe the construction and principle of operation of capacitor start and run single phase induction motor. (16)

———————————

43323

43323