Reg. No. : | | | | | | | | | | |

Question Paper Code: 43323

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

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. 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. 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

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. Slip speed is the

(a) difference of synchronous speed and actual rotor speed

(b) difference of actual rotor speed and synchronous speed

(c) sum of synchronous and rotor speeds

(d) half of the sum of synchronous and rotor speeds

6. What happens when DC supply is given to rotor in induction motor?

(a) it acts as DC motor (b) it acts as synchronous motor

(c) both are correct (d) none of the above

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. What is the distribution factor for a 108 slot, 12 pole, 3-Φ winding?

(a) 0.88 (b) 0.96 (c) 0.92 (d) 1

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

12. Define voltage regulation of transformer.

13. Define slip of a three phase induction motor.

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

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) (i) Derive the torque equation of the DC motor. (8)

(ii) What is back EMF and explain the significance of Back EMF. (8)

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) Discuss the various starting methods of 3 phase induction motors. (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) (i) Describe the construction and principle of operation of capacitor start and run single phase induction motor. (8)

(ii) Explain the construction and working principle of switched reluctance motor with diagrams. (8)