Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code: 34326

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

Fourth Semester

Electronics and Instrumentation Engineering

01UEE426 - PRINCIPLES OF ELECTRICAL MACHINES

(Regulation 2013)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Write the torque equation of DC motors.

2. What is the necessity of starters in DC motors?

3. Why Transformer rating is in kVA?

4. What are the various common connections for 3 phase transformer?

5. Differentiate squirrel cage and split ring induction motor.

6. State the condition for maximum starting torque produced in an induction motor.

7. Why the synchronous motor is not self starting type?

8. List out the different torques of a synchronous motor.

9. List out the applications of permanent magnet synchronous motor.

10. A single phase induction motor is not self starting. Justify.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain the working principle of DC generator.   (8)

    (ii) A 4-pole generator having wave-wound armature winding has 51 slots, each slot
         containing 20 conductors. What will be the voltage generated in the machine
         when driven at 1500 *r.p.m*, assuming the flux per pole to be 7 *mWb*.   (8)

Or

(b) With neat sketch explain the electrical and mechanical characteristics of DC shunt motors. (16)

12. (a) (i) Explain the construction and operating principle of transformer with neat sketch. (8)

   (ii) Derive the e.m.f. equation of transformer. (8)

Or

(b) Draw and explain the working of a transformer on load with phasor diagram. How it affects the power factor of the loaded transformer. (16)

13. (a) Derive an expression for the torque equation of a 3-phase induction motor. (16)

Or

(b) What are the types of starter in three phase induction motor? Explain any two in detail with neat sketch. (16)

14. (a) Explain the principle of operation of a synchronous motor. (16)

Or

(b) (i) Explain the principle of operation of a synchronous motor. (8)

   (ii) Explain the variation in excitation on the armature current of a synchronous motor. (8)

15. (a) (i) Discuss in detail working principle of Capacitor start- and- run motor. (8)

   (ii) Explain in detail working principle of Repulsion type motor. (8)

Or

(b) (i) Discuss in detail the principle operation of Hysteresis motor. (8)

   (ii) Discuss the construction detail and working principle of Switched Reluctance Motor. (8)

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