



B.E DEGREE EXAMINATIONS: DEC 2014

(Regulation 2013)

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U13EIT304 : Electrical Machines and Control Devices

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Direction of induced EMF is given by
 - a) Fleming's Left hand rule
 - b) Fleming's Right hand rule
 - c) Right handed cork screw rule
 - d) Right handed grip rule
2. The foremost condition to be satisfied for self excitation to take place in a DC generator is _____
3. In 3-phase squirrel-cage Induction motor, the rotor conductors are _____ by end rings.
4. Synchronous motors operate on
 - a) lagging power factor only
 - b) unity power factor only
 - c) leading power factor only
 - d) any desired power factor
5. The primary and secondary windings of a two winding transformer always have
 - a) Different number of turns
 - b) Same size of copper wire
 - c) Different voltage ratings
 - d) Same VA rating
6. The all day efficiency of a distribution transformer mainly depends on _____
7. Push button switch comes under the category of
 - a) Non contact type switch
 - b) Selector switch
 - c) Contact type switch
 - d) Limit switch
8. Relay is working based on _____.
9. Universal motor operates with
 - a) AC supply
 - b) AC and DC supply
 - c) DC supply
 - d) AC supply with variable frequency
10. The rotor of hysteresis motor made up of _____

PART B (10 x 2 = 20 Marks)

(Not more than 40 words)

11. List the factors contributing for hysteresis loss.
12. Name the applications of DC series motor.
13. List the factors affecting the speed of three phase induction motor.
14. Differentiate linear induction motor from conventional squirrel cage induction motor.
15. Write the characteristics of ideal transformer.
16. Give the mathematical expression for EMF induced in the secondary of the single phase transformer.
17. Mention any four selection criteria for relays.
18. Compare switches and relays.
19. Write the reluctance principle.
20. List the advantages of brushless DC motor.

PART C (5 x 14 = 70 Marks)

(Not more than 400 words)

Q.No. 21 is Compulsory

21. Write a technical note on the following:
(i) Rotary switches; (ii) Thumbwheel switches; (iii) Reed relay; (iv) Overload relay
22. a) (i) Develop the expression for EMF induced in a DC generator. (7)
(ii) How is the torque developed in a DC motor and derive the expression for the same. (7)
- (OR)**
- b) (i) Explain all the characteristics of a DC shunt motor. (7)
(ii) Draw the power stages of a DC motor. (7)
23. a) Explain the construction and working principle of three phase induction motor.
- (OR)**
- b) (i) Why is single phase induction motor not self starting, Explain. (7)
(ii) Write the concept of synchronous condenser. (7)

24. a) Step by step, develop exact and approximate equivalent circuit of a single phase transformer. (7)

(OR)

- b) (i) Derive the EMF equation of a single phase transformer. (7)
(ii) Describe the variable frequency operation of single phase transformer. (7)

25. a) Explain the construction and working principle of permanent magnet stepper motor with necessary switching table.

(OR)

- b) (i) Describe the working of hysteresis motor. (7)
(ii) Explain the operating principle of servomotor. (7)
