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**B.E. DEGREE EXAMINATIONS: DEC 2014**

(Regulations 2009)

Third Semester

**EEE223: ELECTRICAL MACHINES AND DRIVES**

(Common to Mechanical Engineering and Mechatronics Engineering)

**Time: Three Hours** **Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. _____ is a parameter of magnetic circuit
   a) Capacitance b) Resistance
   c) Inductance d) Reluctance
2. _____ is required in induction motor for self starting
   a) Starter b) Resistance
   c) Rotating magnetic field d) Capacitor
3. Starters are essential for DC motors to
   a) Limit the starting current b) Controlling the starting speed
   c) Limiting the load resistance d) Limiting the load torque
4. Most efficient method of braking is
   a) Mechanical braking b) Regenerative braking
   c) Dynamic braking d) Plugging
5. Pump motor is operated on
   a) Short time duty b) Continuous duty
   c) Intermittent Periodic duty(IPD) d) IPD with starting and braking
6. Line shaft is used in
   a) Group drive b) Individual drive
   c) Multi motor drive d) High power drive
7. Field control of DC motor is employed for
   a) Speed control below rated value b) Speed control above rated value
   c) Torque control below rated value d) Torque control below rated value

8. Ward Leonard control system has

a) Four machines b) Three machines

c) Two machines d) One machine

9. Slip power recovery scheme of the induction motor is _____ control

a) Stator side b) Rotor side

c) Resistance d) Frequency

10. In a voltage source inverter

a) Input current is constant b) Input voltage is constant

c) Output current is constant d) Output voltage is constant

**PART B (10 x 2 = 20 Marks)**

11. State Faraday's law.
12. A 3 phase 4 pole induction motor runs at 1440 rpm when connected to 400V, 50 Hz supply. Calculate the value of percentage slip.
13. State the principle of plugging
14. Mention the starting methods of single phase induction motors
15. Define is short time duty
16. Draw the heating and cooling curve for electric motor
17. State the limitations of Ward-Leonard system?
18. What are the power electronic circuits used for the speed control of DC motors?
19. What is the advantage of V/F control of induction motor?
20. State the principle of AC voltage regulators

**PART C (5 x 14 = 70 Marks)**

21. a) (i) With neat sketches explain the constructional details of DC motor (8)

(ii) Derive the torque equation of DC motor (6)

**(OR)**

b) Explain any two types of single phase induction motors in detail

22. a) (i) Explain the operation of a three point starter with neat sketch. (7)

(ii) Draw and explain direct on line starter. (7)

**(OR)**

b) Explain any two types of braking methods used for DC motors.

23. a) (i) Describe the elements of electric drive system with block diagram (7)

(ii) State and explain the factors influencing the choice of electrical drives (7)

**(OR)**

b) Draw and explain heating and cooling curves of motor drives.

24. a) With neat diagram, explain Ward Leonard method of speed control.

**(OR)**

b) Explain the operation of DC chopper for the speed control of DC motor with neat diagrams.

25. a) Explain the V/f control of voltage source inverter fed induction motor with neat diagram

**(OR)**

b) Explain a slip power recovery scheme for three phase induction motor control

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