

B.E DEGREE EXAMINATIONS: NOV/DEC 2013

(Regulation 2009)

Third Semester

EEE223:ELECTRICAL MACHINES AND DRIVES

(Common to Mechanical & Mechatronics)

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. In Fleming's left hand rule, the middle finger indicates
 - a) Direction of magnetic field
 - b) Direction of current
 - c) Direction of force
 - d) Direction of voltage
2. The back emf in a DC machine is given by
 - a) $E_b = \phi ZNP/60$ A
 - b) $E_b = \phi ZN^2P/60$ A
 - c) $E_b = \phi P/60$ A
 - d) $E_b = \phi Z^2NP/60$ A
3. The starter is used in the motor, because
 - a) To develop high initial torque
 - b) To depress the supply voltage
 - c) To increase the speed of the motor
 - d) To limit the initial armature current
4. The Dynamic braking is also called as
 - a) Reverse voltage braking
 - b) Regenerative braking
 - c) Rheostatic Braking
 - d) Plugging
5. An example for group drive is
 - a) Wet grinder
 - b) Paper mill
 - c) Crane
 - d) Lathe Machine
6. The time taken by the machine to reach a temperature rise of 63.2% of maximum temperature is known as
 - a) Heating time constant
 - b) Cooling time constant
 - c) Short time duty
 - d) Continuous duty
7. The method of controlling the speed of DC motors by changing the resistance in the armature with rheostat is called
 - a) Armature control
 - b) Flux control
 - c) Field control
 - d) Voltage control

8. The DC chopper is a device which converts
- a) Fixed dc voltage to variable ac voltage b) Fixed dc voltage to variable dc voltage
 c) Fixed ac voltage to variable dc voltage d) variable dc voltage to variable dc voltage
9. The speed equation of an induction motor is
- a) $N=N_{s+}(1-s)$ b) $N=N_s(1+s)$
 c) $N=N_{s+}(1+s)$ d) $N=N_s(1-s)$
10. Which of the following is slip recovery system?
- a) Scherbius system b) Cascade control
 c) V/f control d) Pole changing method

PART B (10 x 2 = 20 Marks)

11. DC series motors should be started only with load. Why?
12. Draw the slip-torque characteristics of single phase induction motor.
13. What are the types of starters used for DC machine?
14. Define plugging.
15. What do you meant by electric drives?
16. What is thermal over loading?
17. Mention the main methods adopted for speed control of DC shunt motors.
18. State the advantages of Ward-Leonard methods of speed control.
19. List out the different types of speed control methods in three phase induction motors.
20. What is AC voltage controller?

PART C (5 x 14 = 70 Marks)

21. a) Explain the construction and working of DC series and DC shunt motors with neat sketch.

(OR)

- b) With neat diagram, describe the speed-torque characteristics of three-phase induction motor in detail.

22. a) Explain the working of 4-point starter with circuit diagram.

(OR)

- b) Discuss in detail about the various methods of electrical braking applicable to induction motors.

23. a) Draw and explain the block diagram of an electric drive and also discuss the functions of power modulator.

(OR)

b) Discuss the different classes of duty of motors and also explain the method of determination of power rating.

24. a) Explain with diagram, the classical Ward-Leonard system of speed control of DC motors.

(OR)

b) What is controlled rectifier? How the speed control of DC drive is achieved using fully controlled rectifier?

25. a) Explain any one of the methods of speed control applicable to three phase induction motors.

(OR)

b) Describe the Kramer method of slip-power recovery scheme in detail.
