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Question Paper Code: 50308

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Third Semester

Chemical Engineering

15UEE324 - ELECTRICAL DRIVES AND CONTROL FOR CHEMICAL ENGINEERING

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Power Modulator performs _____ function.
 - Modulates flow of power from source to motor
 - Starting, braking and speed reversal
 - Converts electrical energy of source in the form suitable to the motor
 - All the above
- AC to DC Converters which gives fixed voltage from ac supply of fixed voltage also known as
 - Controlled rectifier
 - Controlled Inverter
 - Uncontrolled rectifier
 - Uncontrolled Inverter
- Counter Torque Braking is called as
 - Regenerative braking
 - Plugging
 - Dynamic Braking
 - None of these
- The method which can be used for speed control of induction motor from stator side is
 - V/F Control
 - Controlling no., of Stator poles to N_s
 - Adding rheostats in stator circuit
 - none of these

5. In 4-point starter, the no volt release is connected across the
- (a) Supply line through a protective resistance
 - (b) In series with field circuit through a protective resistance
 - (c) Either (a) or (b)
 - (d) None of these
6. When two DC series motors are connected in parallel, the resultant speed is
- (a) more than the normal speed
 - (b) less than the normal speed
 - (c) normal speed
 - (d) zero
7. If field current is decreased in Shunt DC motor, the speed of the motor
- (a) Remains same
 - (b) Increases
 - (c) Decreases
 - (d) None of these
8. In Ward-Leonard system, the lower limit of the speed imposed by
- (a) Field resistance
 - (b) Armature resistance
 - (c) Residual magnetism of the generator
 - (d) None of these
9. Rotor rheostat control method of speed control is used for
- (a) Squirrel cage Induction Motors only
 - (b) Slip ring Induction Motors only
 - (c) Both (a) and (b)
 - (d) None of the above
10. No load speed of which of the following which motor will be highest?
- (a) Shunt Motor
 - (b) Series Motor
 - (c) Compound Motor
 - (d) All the above

PART - B (5 x 2 = 10 Marks)

11. What are the classes of duties?
12. How does D.C. motor differ from D.C. generator in construction?
13. What are the methods to reduce the magnitude of rotor current (rotor induced current) at starting?
14. Why is field control method used only above rated speed?
15. What are the different means of controlling induction motor?

PART - C (5 x 16 = 80 Marks)

16. (a) Derive an expression for a thermal model of motor for heating and cooling. Also draw its characteristic curves. (16)

Or

- (b) Explain the factors governing the selection of motors. (16)

17. (a) Explain about the speed-torque characteristics of a DC Shunt Motor with suitable graph and equations. (16)

Or

- (b) Draw Explain the various methods of braking of induction motors. (16)

18. (a) Explain different methods of starting of DC Motors.. (16)

Or

- (b) Explain following with neat circuit diagram, the star-delta starter method of starting squirrel cage induction motor. (16)

19. (a) Explain with neat sketches about the DC Shunt Motor speed control by using single phase fully controlled bridge converter. (16)

Or

- (b) Discuss the Ward-Leonard speed control system with a neat circuit diagram. Also, mention its advantages and disadvantages. (16)

20. (a) Explain the V/f control method of AC drive with neat sketches. (16)

Or

- (b) Explain the static Kramer method and static scherbius method of speed control of three phase induction motor. (16)

