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Question Paper Code : X20481

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Third Semester
Mechanical Engineering
EE 6351 – ELECTRICAL DRIVES AND CONTROLS
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What are the factors that influence the choice of electric drives ?
2. Define heating time constant and cooling time constant.
3. What are the various components of load torque ?
4. What do you understand by electric braking ?
5. Why starters are required ?
6. What is the objective of rotor resistance starter ?
7. Write the disadvantages of armature resistance method of speed control in DC shunt motor.
8. List the applications of chopper fed DC drives.
9. List the types of speed control methods in three phase induction motor.
10. What is AC voltage Regulator ?

PART – B

(5×13=65 Marks)

11. a) Explain the various classes of motor duty with necessary diagrams and examples.

(OR)

b) i) Define an Electric drive and describe the classification of Electric Drives. (6)

ii) Explain the selection of motor power rating for different loading conditions. (7)



12. a) Explain the torque slip and speed torque characteristics of three phase induction motor.

(OR)

- b) What are the different electrical braking methods used in electrical drives ? Explain the methods applied to dc shunt motor.

13. a) Discuss, with circuit diagrams, the star delta starter and auto transformer starter on the basis of starting torque and starting current.

(OR)

- b) Describe with suitable diagrams the function of
 (i) 2 point starter and (6)
 (ii) 3 point starter. (7)

14. a) i) Discuss the Ward-Leonard speed control system with a neat diagram. Also mention its advantages and disadvantages. (6)

- ii) Explain the single phase half wave converter drive speed control for DC drive with waveforms. (7)

(OR)

- b) A 220V, 70A dc series motor has combined resistance of armature and field resistance of 0.12 ohm. Running on no load with field winding connected to a separate source it gave the following Magnetization characteristics at 600 rpm :

I_f A	10	20	30	40	50	60	70	80
V_t V	64	118	150	170	184	194	202	210

Motor is controlled by chopper with a source voltage = 220 V.

Calculate :

- i) Motor speed for a duty ratio of 0.6 and motor current of 60 A. (6)
 ii) Torque for a speed of 400 rpm and duty ratio of 0.65. (7)

15. a) Explain speed control of three phase induction by combined voltage/frequency control.

(OR)

- b) Explain slip power recovery scheme for the speed control of 3 phase induction motor.

PART – C

(1×15=15 Marks)

16. a) How speed of the DC drive can be controlled using chopper ? (15)

(OR)

- b) What are the types of electric drives and explain the factors influencing the choice of electric drives ? (15)