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**Question Paper Code: 52T02**

M.E. DEGREE EXAMINATION, APRIL 2019

Second Semester

Power Electronics and Drives

15PPE202 - DC Drives and Control

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1. (a) (i) List the drawbacks of armature resistance control. CO1- U (3)
- (ii) What do you understand by Constant torque and Constant power drive? CO1- U (3)
- (iii) Discuss various types of electric braking employed in DC drives. CO1- U (14)
- Or
- (b) (i) Clasify the types of motor duty. CO1- U (4)
- (ii) What are the functional elements of an electrical drive? CO1- U (2)
- (iii) Describe multiquadrant operation of DC motor in hoist application. CO1- U (14)
2. (a) (i) Write the motor performance parameters to the considered for converter fed dc drives? CO2-U (2)
- (ii) What is the effect of armature current ripple on the motor performance? CO2- U (2)
- (iii) Explain the motoring and braking operation of three phase fully controlled rectifier control of DC separately excited motor with aid of diagrams and waveforms. Also obtain the expression for motor terminal voltage and speed. CO2- U (16)
- Or
- (b) (i) Difference between uncontrolled rectifiers and controlled rectifiers . CO2- U (4)
- (ii) What is the effect of armature current ripple on the motor performance? CO2- U (2)

- (iii) Explain the operation of a single phase fully controlled converter fed separately excited DC with neat waveforms and derive the speed torque characteristics CO2- U (14)
3. (a) (i) What are the methods of control strategies of chopper control? Which is best suited for DC motor control? CO3- U (4)
- (ii) Explain in detail the working of a multi quadrant control of chopper fed DC series motor. CO3- U (16)
- Or
- (b) (i) What is Time ratio control? CO3-U (2)
- (ii) Draw the diagram of a regenerative chopper fed separately excited DC motor drive. CO3-U (4)
- (iii) With circuit diagram explain the working of four quadrant operation of DC motor. CO3-U (14)
4. (a) (i) Give the transfer function of converter. CO4- U (2)
- (ii) What are the functions of feedback loops in an electrical drive? CO4- U (4)
- (iii) Employ the various blocks of closed loop dc drives. CO4-App (14)
- Or
- (b) (i) Give the transfer function relating speed and field current of a DC motor. CO4- U (4)
- (ii) Demonstrate the operation of P, PI Controllers for closed loop control of dc drives. CO4-App (16)
5. (a) (i) Define PLL of dc drives? CO5-U (2)
- (ii) Write short notes on digital gate firing. CO5-U (4)
- (iii) Develop the program flow chart constant horse power and load disturbed Operations. CO5-App (14)
- Or
- (b) (i) What is meant by micro computer control of dc drives? CO5-U (2)
- (ii) What do you mean by digital control of dc drive? CO5-U (2)
- (iii) Explain the procedure adopted for digital control of dc drive. CO5-U (16)
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