Q.P. Code:**16EE4303** **R16**

Reg. No. | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
M.Tech I Year I Semester Regular & Supplementary Examinations February 2018
POWER ELECTRONIC CONTROL OF DC DRIVES
(Power Electronics)

Time: **3** hour Max. Marks:**60**

(Answer all Five Units **5 X 12 =60** Marks)

UNIT-I

1 Explain the operation of a single phase semi converter fed separately excited DC motor with the help of speed torque characteristic for different firing angles. 12M

OR

2 A 200 Volts, 875 RPM, 150 A separately excited DC motor has an armature resistance of 0.06 ohms. It is fed from a single phase fully controlled rectifier with an ac source voltage of 220V,50 Hz. Assuming continuous conduction, calculate
i. Firing angle for rated motor torque and 750 RPM.
ii. Firing angle for rated motor torque and (500) RPM. 12M

UNIT-II

3 a Explain the concept of shunt capacitor compensation in detail. 6M
b Discuss in detail the effect of highly inductive load on the performance of 3 Φ converter. 6M

OR

4 a Explain the concept of natural commutation. With the help of necessary 1 power circuit and associated waveforms, explain how an AC- DC converter operated as line commutated inverter. 12M

UNIT-III

5 a Discuss the effect of harmonics and its associated problems in DC drive 6M
b With the help of the schematic diagram, explain the operation of 3 converter controlled DC motor drive. 6M

OR

6 a Obtain the expression for the magnitude of sixth harmonic torque and also write its effects on the armature heating. 6M
b Explain steady state analysis of three phase convertor control DC motor drive 6M

UNIT-IV

7 a Explain the operation of four quadrant chopper circuit elaborately. 6M
b Describe how a four quadrant operation can be obtained from a chopper fed DC drive 6M

OR

8 a Explain the concept of pulsating torques in detail 6M
b With the help of neat diagrams, explain the principle of operation of the chopper 6M

UNIT-V

9 Draw a block schematic diagram of a speed controlled separately excited DC motor drive 12M

OR

10 Discuss about dynamic performance of one quadrant chopper controlled separately excited DC motor drive for a step command in speed reference in normalized form. 12M

***** END *****