| O.P.Code: 20EE0225 | R20 | H.T.No. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**
(AUTONOMOUS)

## B.Tech III Year II Semester Regular Examinations August-2023

**POWER SEMICONDUCTOR DRIVES**
(Electrical & Electronics Engineering)

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

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

| | | | | | |
|---|---|---|---|---|---|
| | | **UNIT-I** | | | |
| **1** | | With neat diagram, explain 1-Ø fully controlled converter fed by separately excited DC motor in continuous conduction mode. | **CO1** | **L4** | **12M** |
| | | **OR** | | | |
| **2** | | Using RLE load, analyze the operation of three phase fully controlled converter with neat sketch. | **CO1** | **L4** | **12M** |
| | | **UNIT-II** | | | |
| **3** | | A non-circulating current dual converter is connected to a dc motor. Explain its control strategies for selecting its multi-quadrant operation converter with the help of power circuit diagrams. | **CO2** | **L5** | **12M** |
| | | **OR** | | | |
| **4** | **a** | Explain the operation of closed loop speed control of dc drive. | **CO2** | **L2** | **6M** |
| | **b** | A 230V, 870rpm, 100A separately excited DC motor has an armature resistance of 0.02Ω. It is coupled to an over hauling with a torque of 400N-m. Determine the speed at which motor can hold the Load by regenerative braking. | **CO2** | **L3** | **6M** |
| | | **UNIT-III** | | | |
| **5** | | Describe how the operation of second quadrant can be obtained from chopper fed by separately excited DC motor. | **CO3** | **L2** | **12M** |
| | | **OR** | | | |
| **6** | | A separately excited dc motor is running at 1100rpm, 210V, with an armature resistance of 0.08. The initial speed of the motor is 1200rpm when broken by plugging, Take Ia=140A.<br>(i) To limit the braking current to twice the full load value, calculate the resistance to be placed in armature circuit.<br>(ii) Calculate the braking torque, and when speed is reduced to zero, calculate the torque. | **CO3** | **L3** | **12M** |
| | | **UNIT-IV** | | | |
| **7** | | Explain briefly Voltage source inverter control of induction motor? | **CO4** | **L2** | **12M** |
| | | **OR** | | | |
| **8** | | Explain the speed control method for 3-Ø induction motor bu using Cycloconverter. | **CO4** | **L3** | **12M** |
| | | **UNIT-V** | | | |
| **9** | | Discuss the operation of a voltage source inverter fed synchronous motor Drive. | **CO5** | **L2** | **12M** |
| | | **OR** | | | |
| **10** | | Explain the closed loop control scheme of adjustable speed synchronous motor drive. Mention its need and advantages. | **CO5** | **L2** | **12M** |

***** END *****