JYOTHI ENGG. COLLEGE LIBRARY
THRISSUR EDUCATIONAL TRUST
CHERUTHURUTHY

QP CODE:

Reg No: _____

Name: _____ **PAGES:4**

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SECOND SEMESTER M.TECH DEGREE EXAMINATION, JUNE 2024

Course Code: 222EEE071

Course Name: ELECTRIC CHARGING SYSTEMS FOR ELECTRIC VEHICLES

Max. Marks : 60 **Duration: 2Hrs 30 Minutes**

PART A

Answer All Questions. Each Question Carries 5 Marks

1. What is a two quadrant chopper? Explain. **(5)**
2. What is inverted mode of operation of the converter? Explain. **(5)**
3. Draw and explain the configuration of a level-1 charger. **(5)**
4. Explain about the battery management systems used in EV. **(5)**
5. Explain the CHAdeMo charging protocol for EV. **(5)**

Part B

(Answer any five questions. Each question carries 7 marks)

6. Draw the circuit of 3 phase fully controlled rectifier with RL load and explain the working for α=60 degree with necessary waveforms. Derive the expression for average output voltage. **(7)**
7. Draw the circuit of 3 phase fully controlled rectifier with RLE load and explain the working for α=600 with necessary waveforms. Derive the expression for average output voltage. **(7)**
8. Explain about Types of charging stations - AC Level 1 & 2. **(7)**
9. Explain the operation of level-3 battery charger with a neat circuit diagram. **(7)**
10. Explain the working of a Buck-Boost regulator, showing relevant waveforms and derive the expression for its output voltage. **(7)**
11. Explain about Fuel cell based energy storage systems. **(7)**
12. Describe the various charging standards used for electric vehicles. **(7)**

****