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PRESIDENCY UNIVERSITY BENGALURU

**SET-B**

SCHOOL OF ENGINEERING

**END TERM EXAMINATION – MAY/JUN 2024**

**Semester :** Semester IV - B.Tech EEE - 2022

**Course Code :** EEE3036

**Course Name :** Battery Management Systems

**Program :** B.Tech. Electrical and Electronics Engineering

**Date :** June 21, 2024

**Time :** 9:30 AM - 12:30 PM

**Max Marks :** 100

**Weightage :** 50%

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and non-programmable calculator are permitted.*
4. *Do not write any information on the question paper other than Roll Number.*

**Part - A**

**Answer any 5 questions 5 x 4M= 20M**

* 1. Explain the factors affecting the performance of batteries used in EVs.
  2. Classify different functionalities of battery.
  3. Classify the batteries types with an example.
  4. List the types of BMS topologies?
  5. Explain the cell chemistry of Li-ion battery.
  6. State the concept of DoD and State of Health.
  7. Draw and explain the equivalent circuit of a Battery.

(CO1) [Knowledge] (CO1) [Knowledge] (CO2) [Knowledge] (CO2) [Knowledge] (CO3) [Knowledge] (CO4) [Knowledge] (CO5) [Knowledge]

**Part - B**

**Answer any 4 questions 4 x 10M = 40M**

* 1. Explain the following related to BMS (i) Cell Protection. (ii) Charge Control (iii) SOC Determination (iv)SOH Determination (v)Cell balancing.

(CO1) [Comprehension]

* 1. Explain the lithium based batteries.
  2. Explain the protocol Communication Via CAN Bus in BMS.

(CO2) [Comprehension] (CO3) [Comprehension]

* 1. Examine the importance of Battery pack sensing Voltage, Temperature, and Current in BMS.

(CO3) [Comprehension]

* 1. Explain the concept of Isolation control and thermal control in a BMS based Battery pack.

(CO4) [Comprehension]

* 1. State the importance of a C-rating for the battery with examples and list the different C-rated batteries available in the current market.

(CO5) [Comprehension]

**Part - C**

**Answer any 2 questions 2 x 20M = 40M**

* 1. Explain the parameters and configuration of the battery.
  2. Review the IoT-Based Battery Management System for EVs application.

(CO1) [Application] (CO3) [Application]

* 1. Mr. Ganesh wants to apply serial bus communication to save copper wires in Electric Vehicle. Suggest any standard architecture with neat and clean diagram to send the data sequentially to communicate with other devices in BMS.

(CO5) [Application]