

Assignment - 3,

Q1. What is a BMS? Types of BMS and differentiate the types of BMS.

⇒ BMS stands for Battery Management Systems. It manages the battery pack by keeping the battery parameters in check by continuously monitoring it. It keeps it safe by ensuring it operates within safety parameters like temperature range, high voltage, current etc. and balancing the lithium ion cells within the battery pack.

* Types of BMS :-

↳ Hardware BMS: It provides basic safety features by controlling and monitoring the operating parameters like; overvoltage cutoff; undervoltage cutoff; over temperature cutoff; over current detection and continuous current.

↳ Software BMS: In addition to all the functions of hardware BMS it can collect and record data and store it in its memory and can transfer it over internet CAN or Bluetooth.

Q2. What are the technical parameters to keep in ^{mind} while procuring a BMS for assembling a battery pack?

⇒ The technical parameters to keep in mind while procuring BMS are:-

- Battery Voltage: The operating voltage of a battery pack for which the BMS needs to be designed i.e. upper voltage cutoff and lower voltage cutoff.

- Continuous current: The operating currents for battery pack that will be utilized for charging and discharging at different rate.
- Temperature range: The max. temperature at which battery pack should be cut-off.
- Over current detection: - The max. current the BMS should allow to pass through for very small time during controller failure before cutting of battery pack.

Q3. What is the purpose of BMS with communication? What are the various protocols of communication used in a BMS?

⇒ The purpose of BMS with communication is to record and store the data of various operating parameters and send it VCM which can be analysed to determine various parameters like State of health, state of charge, total energy delivered, number of charge and discharge cycles, driving patterns, irregular use or aggressive use, etc. It can also help in improving the existing drive cycle and hence design optimize the powertrain efficiency by optimizing the vehicle parameters of mod. while selection of battery, motor and components and programming controllers and control parameters for powertrain integration.