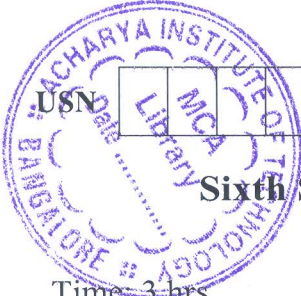


# CBCS SCHEME



18EE646

## Sixth Semester B.E. Degree Examination, June/July 2024 Electric Vehicles Technologies

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Draw diagram of various configuration of 'Electrical Vehicles'. (10 Marks)
- b. With a neat schematic diagram, explain the configuration of parallel hybrid electric drive. (10 Marks)

OR

- 2 a. Explain any 5 model of hybrid electric vehicle operation with a schematic diagram. (10 Marks)
- b. State various architectures of hybrid electric drive train explain any one in detail. (10 Marks)

### Module-2

- 3 a. What are the various Battery Parameters? Explain them in detail. (10 Marks)
- b. Explain basic working principles of fuel cell with neat diagram. (10 Marks)

OR

- 4 a. State various types of batteries used in electric vehicle and explain them. (10 Marks)
- b. Explain super capacitor as storage for EV and HEV. (10 Marks)

### Module-3

- 5 a. Draw and explain the functional block diagram of EV propulsion system. (10 Marks)
- b. Draw and explain basic EV induction motor drive configuration. (10 Marks)

OR

- 6 a. What are the various methods of speed control in DC drive explain various operating characteristics? (10 Marks)
- b. What are the different classification of EV motors? (10 Marks)

### Module-4

- 7 a. Explain how power rating design of the traction motor done in series hybrid train. (10 Marks)
- b. What are the various operating mode of the parallel drive train? (10 Marks)

OR

- 8 a. Explain the control strategies of parallel hybrid drive train. (10 Marks)
- b. Explain Engine design and transmission design for hybrid drive train. (10 Marks)

### Module-5

- 9 a. What are various method of charging EV from grid? (10 Marks)
- b. Explain Z-converter for battery charging. (10 Marks)

OR

- 10 a. Explain transformer less topology for battery charging. (10 Marks)
- b. Explain various charging methods for batteries in EV. (10 Marks)

\* \* \* \* \*

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.