



# CBCS SCHEME

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18AU754

## Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 Introduction to Electric Vehicles

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Explain past 30 years development in electric vehicles. Also explain present and future trends in electric vehicles. (12 Marks)  
b. Why there is need of electric drive? Explain. (08 Marks)

OR

- 2 a. Explain engineering philosophy of electrical vehicles. (06 Marks)  
b. Describe EV concept and key EV technologies. (08 Marks)  
c. Mention major issues of electric vehicles. (06 Marks)

### Module-2

- 3 a. Explain the following :  
i) Conductors  
ii) Insulators  
iii) Resistors  
iv) Solenoids (12 Marks)  
b. With neat sketch, explain construction and operation of AC motor. (08 Marks)

OR

- 4 a. Explain operation of DC generator with neat diagram. (10 Marks)  
b. Describe weight and size parameters and performance parameters in electric vehicles. (10 Marks)

### Module-3

- 5 a. Explain major components of battery operated electric vehicle with neat layout. (12 Marks)  
b. Compare BOEV with IC engine vehicle. (08 Marks)

OR

- 6 Write short notes on :  
a. Flywheel energy storage  
b. Inverter / Braking  
c. Regenerative braking  
d. Basic diagnosis and precautions of EV. (20 Marks)

### Module-4

- 7 a. Explain construction and working of lead-acid battery with neat sketch. (10 Marks)  
b. With neat sketch, explain lithium-ion and lithium-polymer battery. (10 Marks)

OR

- 8 a. Describe construction and working of Nickel Cadmium and Nickel – Metal hydride battery with neat sketch. (12 Marks)  
b. Write short note on High Discharge Capacitor. (08 Marks)

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Module-5

- 9 a. Explain construction and working of alkaline fuel cell with neat sketch. (08 Marks)  
b. With neat sketch, explain proton exchange membrane fuel cell. (06 Marks)  
c. Explain Phosphoric acid fuel cell with neat sketch. (06 Marks)

OR

- 10 Explain the following :  
a. Solid oxide fuel cell  
b. Hydrogen Storage Systems  
c. Reformers  
d. Fuel Cell Electric Vehicle. (20 Marks)

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