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18AU823

## Eighth Semester B.E. Degree Examination, June/July. 2023

### Electric and Hybrid Vehicle

Time: 3 hrs.

Max. Marks: 100

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

#### Module-1

- 1 a. Write the performance characteristics of road. Vehicles with neat graph. (12 Marks)
- b. Explain briefly about predicting Fuel Economy. (08 Marks)

**OR**

- 2 a. Explain the principle and working of DC motors, also list some of its advantages. (12 Marks)
- b. Explain compound wound and separately excited DC motors. (08 Marks)

#### Module-2

- 3 a. Explain the principle and working of AC motors, also list some of its advantages. (12 Marks)
- b. Write a note : Switched Reluctance Motor. (08 Marks)

**OR**

- 4 a. Describe continuously variable Transmission with neat sketch, also mention applications and advantages. (12 Marks)
- b. Write a notes: i) Locomotive Drives ii) Series and parallel switching. (08 Marks)

#### Module-3

- 5 a. Explain Grade and Cruise target of hybrid power plant. (10 Marks)
- b. Explain the Launching and Boosting concept of Hybrid power plant. (10 Marks)

**OR**

- 6 a. Describe engine Downsizing : Range and performance of Engine Fraction. (12 Marks)
- b. Write usage requirements of Engine Fraction. (08 Marks)

#### Module-4

- 7 a. Explain sizing of propulsion motor and sizing power Electronics with neat sketch. (12 Marks)
- b. Explain Matching Factor between electric drive and ICE. (08 Marks)

**OR**

- 8 a. Describe the construction and working principle of Lithium Battery, with suitable diagram. (12 Marks)
- b. Write short notes :  
i) High Discharge capacitor ii) Fly wheeler iii) Battery parameter. (08 Marks)

#### Module-5

- 9 a. Illustrate the working of Alkaline Fuel cell with sketch and reaction. (12 Marks)
- b. Write the different types and characteristics of fuel cells. (08 Marks)

**OR**

- 10 a. Illustrate the working of Proton-Exchange membrane Fuel cell with neat sketch and reaction. (12 Marks)
- b. Describe the working principle of Hydrogen storage system reformer with neat sketch. (08 Marks)