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**Eighth Semester B.E. Degree Examination, June/July 2024**  
**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 vehicle. (10 Marks)  
 b. Explain briefly about pre-directing fuel economy (10 Marks)

**OR**

- 2 a. Derive the calculation for road load. (10 Marks)  
 b. Explain series and shunt wound D.C motors. (10 Marks)

**Module-2**

- 3 a. Explain brushers D.C motor with neat sketch. (10 Marks)  
 b. Explain switched reluctance motor with neat sketch. (10 Marks)

**OR**

- 4 a. Describe continuously variable transmission with a neat sketch. (10 Marks)  
 b. Write a short note on power assist and power split configurations. (10 Marks)

**Module-3**

- 5 a. Explain grade and cruise targets of hybrid power plant. (10 Marks)  
 b. Explain launching and boosting concept of hybrid power plant. (10 Marks)

**OR**

- 6 a. Describe engine downsizing range and performance of engine fraction. (10 Marks)  
 b. Write the usage requirements of engine fraction. (10 Marks)

**Module-4**

- 7 a. With a neat sketch explain sizing of propulsion motor. (10 Marks)  
 b. With schematic representation explain sizing of power electronics. (10 Marks)

**OR**

- 8 a. Describe the constructional details of lead acid battery with neat sketch. (10 Marks)  
 b. Write the differences between acid batteries and alkaline batteries. (10 Marks)

**Module-5**

- 9 a. Write the different types and characteristics of fuel cells. (10 Marks)  
 b. With a neat sketch, explain proton exchange membrane fuel cells. (10 Marks)

**OR**

- 10 a. Describe briefly hydrogen storage system with schematic representations. (10 Marks)  
 b. With neat sketch, explain molten carbonate fuel cells. (10 Marks)

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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.