



10AU841

Eighth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Hybrid Vehicles

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Explain the performance characteristics of road vehicles with a suitable graph. (10 Marks)
b. What is Grid connected hybrids? Also classify the vehicle V2G under SAE J1772. (10 Marks)
- 2 a. With a suitable sketch, explain the D.C motor used in Hybrid Electric vehicle. List out the advantages and disadvantages. (10 Marks)
b. Explain the operating principle of induction motors? (10 Marks)
- 3 a. With a block diagram, explain the torque control of the BLDC motor. (10 Marks)
b. With a suitable graph, explain Torque – speed characteristics of switched Reluctance motor. (10 Marks)
- 4 a. Explain the configuration of series hybrid electric drive train with a block diagram. Mention its advantages and disadvantages. (10 Marks)
b. Suggest a transmission configuration of single shaft torque combination for mild hybrid drive train. With a neat sketch, justify your answer. (10 Marks)

PART – B

- 5 a. With a suitable graph, explain the series and parallel RBS (Regenerative Braking System). (10 Marks)
b. Write short notes on :
i) Engine downsizing ii) Range and performance iii) Usage Requirements. (10 Marks)
- 6 a. With a neat sketch, explain the epicyclic gear set with its governing equation and input output relationship. (10 Marks)
b. With a schematic, explain the operation of Wilson type stepped automatic transmission. (10 Marks)
- 7 a. With a neat sketch, explain the construction and working principle of Lead-Acid battery and Nickel-Cadmium Battery. (10 Marks)
b. Discuss the battery parameters used in Hybrid Electric Vehicle. (10 Marks)
- 8 a. List out the types of Fuel cells available and also mention the fuel and Electrolyte used in Fuel cells. (10 Marks)
b. Briefly explain the following :
i) Hydrogen storage systems
ii) Reforms
iii) Flywheels. (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.