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10AU841

Eighth Semester B.E. Degree Examination, June/July 2019
Hybrid Vehicles

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting
atleast TWO questions from each part.**

PART – A

- 1 a. What are the characteristics of a road vehicle? Explain fuel economy in hybrid vehicles. (10 Marks)
- b. How regenerative brakes are useful in hybrid vehicle? (10 Marks)
- 2 a. Explain the principle of operation and performance of DC motor drives with sketches. (10 Marks)
- b. How speed and torques are controlled in brushless DC motor? Explain with block diagram. (10 Marks)
- 3 a. Sketch and explain induction type AC motor. Mention the merits and application of induction type AC motor. (10 Marks)
- b. What is a synchronous type AC motor? (06 Marks)
- c. Explain switched reluctance. (04 Marks)
- 4 a. Explain : i) series hybrid ii) parallel hybrid vehicles with neat sketches. (12 Marks)
- b. What is Continuously Variable Transmission (CVT)? Explain in detail. (08 Marks)

PART – B

- 5 a. Write a note on :
i) Performance
ii) Range
iii) Requirements of hybrid power plant. (12 Marks)
- b. Discuss in detail on drive cycle implication. (08 Marks)
- 6 a. Explain the significance of sizing power electronics. (07 Marks)
- b. Briefly explain the engine downsizing. (07 Marks)
- c. Write a note on ultra capacitor. (06 Marks)
- 7 a. Enumerate types of Batteries. Explain any one type. (08 Marks)
- b. With a neat sketch, explain construction and working of lead-acid battery. (12 Marks)
- 8 a. Sketch and explain a basic fuel cell. (05 Marks)
- b. List different fuel cells. Explain the working of a proton exchange membrane fuel cell. (10 Marks)
- c. What is flywheel? Explain the flywheel which is used in hybrid vehicles. (05 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.

