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Fifth Semester B.E. Degree Examination, July/August 2021 Alternative Energy Sources for Automobiles

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Analyze in detail the necessity of alternative energy sources and indicate the implementation business of alternative fuels. (10 Marks)
b. Illustrate the classification of alternative fuels and discuss fuel quality related to emissions. (10 Marks)
- 2 a. List the types of collectors and explain the constructional features of liquid flat plate collector. (10 Marks)
b. Analyze the need for solar energy storage system and discuss the different methods of storage. (10 Marks)
- 3 a. Explain the different types of biogas plants. (10 Marks)
b. Discuss the factors operating generation of biogas. (10 Marks)
- 4 a. List the modifications required for ethanol in IC engines and discuss its performance characteristics. (10 Marks)
b. Illustrate in detail the properties of alcohol fuels. (10 Marks)
- 5 a. Sketch and explain the working of electrolysis for production of hydrogen. (10 Marks)
b. List and explain the methods of hydrogen storage. (10 Marks)
- 6 a. Discuss the composition, properties and performance characteristics of compressed natural gas. (10 Marks)
b. What are the composition of LPG? Illustrate its advantages and disadvantages. (10 Marks)
- 7 a. Explain the key properties of coal water slurry and its emission characteristics. (10 Marks)
b. Illustrate the production of coal water slurry. (10 Marks)
- 8 a. Evaluate the limitations of water as fuel for IC engine. (05 Marks)
b. Justify the suitability of future alternative fuels for the future. (05 Marks)
c. Explain the performance of fuel cell and highlight the significance of compressed air vehicle. (10 Marks)
- 9 a. "Lead acid batteries are not suited for electric vehicles". Justify the statement. (05 Marks)
b. List the components of an EV. (05 Marks)
c. Explain the features of Lithium Ion battery. (10 Marks)
- 10 a. What is the basic principle of hybrid vehicles? Illustrate the configuration of hybrid vehicle power train. (10 Marks)
b. What is the significance of dual fuel engines? Explain with the help of diagram dual fuel engine operation. (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.