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# P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

**Eighth Semester, B.E. - Automobile Engineering**

**Semester End Examination; May/June - 2018**

**Alternative Energy Sources for Automobiles**

Time: 3 hrs

Max. Marks: 100

*Note: Answer FIVE full questions, selecting ONE full question from each unit.*

## UNIT - I

- 1 a. Briefly discuss the need of Non-Conventional energy sources for future power needs of the country. 10
- b. What is meant by renewable energy sources? List the advantages and limitations of renewable energy sources. 10
- 2 a. Explain different solar energy storage system. 10
- b. What are the factors to be considered for selection of site in WEC systems? 10

## UNIT - II

- 3 a. Explain properties, advantages and disadvantages and applications of LPG in automotives. 10
- b. Explain utilization of hydrogen gas as an alternative fuel. 10
- 4 a. Explain hydrogen storage methods. 10
- b. Explain electrolytic production of Hydrogen. 10

## UNIT - III

- 5 a. What are the factors affecting generation of Biogas? 10
- b. Classify Biogas plants. Explain double stage process. 10
- 6 a. Explain advantages and disadvantages of Biodiesel. 6
- b. Explain methanol as an alternative fuel for vehicles. 4
- c. What are the factors to be considered for selection of site for Biogas plant? 10

## UNIT - IV

- 7 a. Explain the production of HYTHANE and HCNG. 10
- b. Explain the production of Di-Methyl Ether (DME). 10
- 8 a. What are the different Biomass feed stock? 10
- b. Discuss applications and emissions of producer gas. 10

## UNIT - V

- 9 a. Explain Coal Water Slurry (CWS) as an engine fuel. 10
- b. What are Nano Energetic Materials and advantages of solid Nano Particle fuels? 10
- 10 a. Explain components of Electric Vehicles. 10
- b. Explain performance characteristics, advantages and disadvantages of Electric Vehicle System (EVs). 10