



P.E.S. College of Engineering, Mandya - 571 401
 (An Autonomous Institution affiliated to VTU, Belgaum)
Eighth Semester, B.E. – Automobile Engineering
Semester End Examination; June/July - 2015
Alternative Energy Sources for Automobiles

Time: 3 hrs

Max. Marks: 100

Note: i) Answer any **FIVE** full questions selecting at least **TWO** full questions from each part.
 ii) Any missing data may be suitably assumed

PART – A

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| 1. a. | Discuss the need of alternative energy sources. | 5 |
| | b. Name the different alternative energy sources. | 3 |
| | c. Discuss the merits and limitations of following energy sources : | 12 |
| | i) Solar energy ii) Wind energy iii) Tidal energy | |
| 2.a. | Define with neat sketch the following terms related to solar radiation Geometry. | |
| | i) Altitude angle ii) Zenith angle | 6 |
| | iii) Solar Azimuth angle iv) the slope | |
| | b. Draw and explain construction and working of flat plate collector. | 8 |
| | c. Explain the working of solar cell for current generation. | 6 |
| 3.a. | Write advantages and disadvantages of WECS. | 6 |
| | b. Describe the main considerations in selecting site for wind generators. | 8 |
| | c. Draw and explain wind energy system with its main components. | 6 |
| 4. a. | Describe thermo chemical method of hydrogen production. | 6 |
| | b. Explain different methods of hydrogen storage. | 8 |
| | c. Write short notes on : | 6 |
| | i) Use of LPG for I.C. engines ii) CNG for I.C. engines | |

PART - B

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| 5.a. | What do you mean by anaerobic digestion? Explain factors effecting bio-digestion. | 10 |
| | b. Explain use of a straight vegetable oil and Bio-diesel for I.C. engines. | 10 |
| 6 a. | Describe production of Hythane and HCNG with block diagram. | 10 |
| | b. Discuss the use of tyre pyrolysis and plastic oils for I.C. engines. | 10 |
| 7. a. | Describe production of coal slurry. Also write its suitability as fuel for I.C. engines. | 10 |
| | b. Write in detail use of compressed air and water for automotive applications. | 10 |
| 8. a. | Draw and explain working of hybrid cars. | 10 |
| | b. Write advantages and disadvantages of electric vehicles. | 10 |