

# CBCS Scheme

USN

--	--	--	--	--	--	--	--	--	--

15AU562

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018

## Alternate Energy Sources for Automobiles

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. Discuss about the types of energy sources and their availability. (08 Marks)  
b. Classify the alternative fuels available for automotive vehicles. Mention the advantages of LPG. (08 Marks)

OR

- 2 a. With the help of a schematic diagram define :  
i) Altitude angle ii) zenith angle iii) solar azimuth angle. (08 Marks)  
b. Classify solar energy collectors. With a neat sketch explain the working of a flat plate collector. (08 Marks)

### Module-2

- 3 a. Classify different types of bio-gas plants and explain the same, briefly. (08 Marks)  
b. List out advantages (any seven) and hazards of bio-gas. (08 Marks)

OR

- 4 a. What are the raw materials used for biodiesel production? Discuss. (06 Marks)  
b. List out the advantages and disadvantages of methanol (three each). (06 Marks)  
c. Write a short note on biodiesel production. (04 Marks)

### Module-3

- 5 a. Discuss various safety systems used to handle hydrogen. (08 Marks)  
b. Mention any three advantages and three disadvantages of hydrogen. (03 Marks)  
c. Write a brief note on emissions from hydrogen compared to other fuels. (05 Marks)

OR

- 6 a. Discuss the production of CNG and LNG. (06 Marks)  
b. List out the advantages of using ANG in IC engines. (04 Marks)  
c. What are the different areas of application of ANG? Discuss briefly. (06 Marks)

### Module-4

- 7 a. What are the significant observations from emission studies from Coal Water Slurry (CWS)? (06 Marks)  
b. Describe the production of Reformulated Gasoline (RFG). (05 Marks)  
c. Mention the benefits of Emulsified fuels V/s diesel fuel. (05 Marks)

OR

- 8 a. Discuss in detail the advantages of Pulverized Metal Fules (PMF). (05 Marks)  
b. List out the health hazards of ammonia. (05 Marks)  
c. What are the features of boron –water reactions? (06 Marks)

**Module-5**

- 9 a. With a neat schematic sketch describe the major electrical components of an EV system. (08 Marks)  
b. Discuss the criteria for choosing the battery of an Electric Vehicle (EV). (08 Marks)

OR

- 10 a. Describe the important HEV drive train components. (05 Marks)  
b. List out any five advantages of hybrid vehicles. (05 Marks)  
c. With a neat sketch explain the working of a duel fuel engine. (06 Marks)

\*\*\*\*\*