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Manipal Institute of Technology, Manipal

Constituent Institute of Manipal University



VI SEMESTER B.TECH (AUTOMOBILE ENGINEERING) END SEMESTER EXAMINATIONS, JUNE/JULY 2016

SUBJECT: ALTERNATE ENERGY SOURCES FOR AUTOMOTIVES
[AAE 380]

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ❖ Answer **ANY FIVE FULL** the questions.

- 1A. What are the reasons for variation in solar radiation reaching the earth than received at the outside of the atmosphere? (02)
- 1B. Sketch and explain the working of evacuated tube type of solar collector. (05)
- 1C. Contrast the differences between pyrheliometer and pyranometer. (03)
- 2A. Differentiate back pass and screen type of solar air heaters. (03)
- 2B. Discuss the process of electricity generation by using photovoltaic array. (03)
- 2C. Sketch and explain the constructional and functional features of compound parabolic type of collector. (04)
- 3A. Explain forced solar water heating system. (03)
- 3B. Derive the expression to determine the collector's efficiency with the case of flat plate solar collectors. (04)
- 3C. Differentiate dry fermentation with wet fermentation. (03)
- 4A. Explain the challenges related to the synthetic gas composition. (03)
- 4B. Sketch and explain constructional features and characteristics of Chinese digester. (04)
- 4C. What are the factors which effect the process of bio-digestion? Explain any (03)

two.

- 5A. Sketch and explain the working principle of fluidized bed type of gasifier and the advantages for the same. (04)
- 5B. Sketch and explain the working of down draft gasifier. (03)
- 5C. Write a note on the architecture of electric power train. (03)
- 6A. Discuss the power flow control diagram with the case of complex hybrid powertrain. (05)
- 6B. Sketch and explain the working of Hydrogen fuel cell. (03)
- 6C. What is meant by rolling resistance? Give the expression. (02)