



KERALA AGRICULTURAL UNIVERSITY
B. Tech. (Agrl. Engg.) 2021 Admission
V Semester Final Examination – January 2024

Fpme.3111

Bio-Energy Systems: Design and Application (1+1)

Marks: 50
Time: 2 hours

I Fill in the blanks

(10x1=10)

1. Biogas is composed of
2. Moisture content of biomass is determined at a temperature of
3. Instrument required for determination of ash content is _____.
4. Syn gas contains
5. Steam methane reforming is used to produce gas.

State True or False

6. Producer gas is produced by a process called biomethanation.
7. Calorific value of biogas is higher than producer gas.
8. A fuel cell is used to generate electricity from hydrogen.
9. KVIC reactor design consists of floating gas holder.
10. Higher carbon content in biomass causes lowering of calorific value.

II Write short notes on ANY FIVE of the following

(5x2=10)

1. Describe pyrolysis process.
2. Write a short note on fluidized bed reactor
3. What are the maintenances in a biogas plant?
4. How alcohol is produced?
5. What are the differences between briquettes and pellets?
6. What is the principle of fuel cell?
7. How producer gas is cleaned?

III Answer ANY FIVE of the following

(5x4=20)

1. What is an energy farm? How it helps in reducing green house gas emission?
2. What are different zones of a downdraft gasifier? Describe in brief.
3. What are the advantages and disadvantages of biomethanation process?
4. Describe the different components of a UASB reactor.
5. Describe the process of briquetting.
6. Find out air-fuel ratio of methane.
7. What are the different sources of ethanol?

IV Write an essay on ANY ONE of the following

(1x10=10)

1. Describe about factors affecting biogas production.
2. Describe biomass incineration, gasification and pyrolysis process in details with proper diagrams and chemical reactions.
