Reg. No.										

GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
(GIET UNIVERSITY)

B. Sc. (Ag.)(Fifth Semester) Examinations, November 2024

FMP-312 – Renewable Energy & Green Technology

Time: 2 hrs | Maximum : 50 Marks

The figures in the right hand margin indicate marks.

PART – A

Q.1. Fill in the blanks with suitable word / figure. **(0.5 x 10 = 5 Marks)**

a. Solar energy can be utilised through two different routes as ..... and.....
b. The collectors moved on one axis in order to follow the movement of the sun is called.....
c. The temperature attained with ..... collector is more than 300 °C.
d. Cellular respiration is an example of ..... combustion.
e. ..... is a technology for densification of biomass.
f. The bullocks or cows give about ..... kg dung per day.
g. The two most common types of biofuels are ..... and.....
h. ..... is made from vegetable oils, animal fats or recycled greases.
i. Complex compound such as fat, protein, carbohydrates are broken into simple water soluble organic compounds through the influence of water called.....
j. Carbon to nitrogen ratio of slurry should be.....

Q. 2. Define (or) Explain the following in one or two sentences. **(1 x 5 = 5 Marks)**

a. Ultimate Analysis
b. Proximate Analysis
c. Retention Period
d. Scum
e. Pyranometer

Q3. Match the following **(0.5 x 10 = 5 Marks)**

Column – A		Column – B	
(a)	Methane	(i)	Fixed dome biogas plant
(b)	Proximate analysis	(ii)	Low pressure briquetting technology
(c)	Ultimate analysis	(iii)	Sugar beet
(d)	Retention period is less	(iv)	Transesterification process.
(e)	Gas Production is Uneven	(v)	Biogas
(f)	Less Scum trouble	(vi)	Moisture
(g)	Janata biogas plant	(vii)	Hydrogen
(h)	Machines require addition of binding materials.	(viii)	Continuous type Biogas Plant
(i)	Bio-ethanol	(ix)	Batch Type Biogas Plant
(j)	Biodiesel	(x)	Floating Drum type Biogas Plant

Q4. Write True or False against each statement **(0.5 x 10 = 5 Marks)**

a. Briquettes produced by Screw Press technology have a hole in the center which makes it burn quickly.

b. B20 indicates 80% Diesel and 20% Biodiesel

c. The solar collector is a device designed to absorb incident solar radiation and to transfer the energy to a fluid passing in contact with it.

d. Flat plate collector is example of non concentrating type solar collector.

e. Focusing Plate Collector is used for achieving temperature range 100 °C to 300 °C.

f. The flow passages conduct the working fluid through the solar collector.

g. Solar Box Cooker employs greenhouse effect.

h. Conduction is the most common form of heat transfer and occurs via physical contact.

i. Drying is a process of moisture removal due to simultaneous heat and mass transfer.

j. In case of Solar Pond, Salinity gradient prevents convection current.

PART – B

Attempt *ANY FIVE* questions. All question carries equal marks **(6 x 5 = 30 Marks)**

5. Differentiate between floating Drum type Biogas plant and Fixed Dome type biogas plant.

6. Explain downdraft Gasifier with help of neat sketch.

7. Explain Active or forced circulation solar water heater with help of neat sketch.

8. Explain direct type solar cabinet dryer with help of neat sketch.

9. Explain Biodiesel production process from Jetropha with help of proper flowchart.

10. Explain various Renewable Energy Sources with help of neat sketch.

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