Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

B. Sc. (Ag.) (Fifth Semester - Regular) Examinations, November – 2025

FMP(Ag.)-312 – Renewable Energy and 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. The full form of NEERI is ……..
b. The main constituent of producer gas is ……..
c. The value of equivalence ratio for effective gasification is …….
d. The quantity of biomass consumed per unit time and unit cross sectional area of gasifier is called ……...
e. The more wind energy plants are located in ……. State.
f. The value of concentration ratio of flat plate collector is ……
g. The longest day of year is on ……
h. Maximum temperature obtained in box- type solar cooker is about …….
i. Solar pond consist of ……. Zones.
j. One Langley is about ……..

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

a. Photovoltaic Effect
b. Doping
c. Solar flux
d. Solar Insolation
e. Equivalence ratio

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

Column – A		Column – B	
(a)	Cross Draft Gasifier	(i)	Global Radiation
(b)	Fluidised bed Gasifier	(ii)	Beam Radiation
(c)	Janta Type Biogas Plant	(iii)	Bright Sunshine Hours
(d)	Deenbandhu Type biogas plant	(iv)	Solar Still
(e)	Energy Plant	(v)	Shortest path length
(f)	Equivalence ratio	(vi)	Terminal velocity
(g)	Pyranometer	(vii)	Chinese plant
(h)	Pyrheliometer	(viii)	Action for Food Production
(i)	Sunshine Recorder	(ix)	Jatropha
(j)	Solar Distillation System	(x)	0.2 -0.4

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

a. Emission is proportional to T^4.

b. Mineral wool is used as insulator.

c. Bottom zone of solar pond is known as storage zone.

d. In an intrinsic semiconductor material, the fermi level exists in the centre of energy gap.

e. Irrigation is application of solar water pump.

f. The covered box of box type solar cooker is made airtight to reduce heat loss by conduction.

g. Main constituent of biogas is carbon dioxide.

h. Cellulose is a linear polymer of D-Glucose.

i. One cow produces 10 kg dung per day.

j. The slurry left behind in digester is a good manure.

PART – B

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

5. Explain classification of Energy resources.

6. Explain Updraft gasifier with help of schematic diagram.

7. Explain solar pond with help of schematic diagram.

8. Explain production process of Biodiesel from Jatropha curcas with help of flowchart.

9. Explain Solar cabinet dryer with help of schematic diagram.

10. Farmer wishes to construct a 5 m^3 capacity biogas plant with a cylindrical digester. The depth of digester below the ground level is restricted to 5 m. Assume that 1 kg of cow dung produces 0.04 m^3 of gas per day and that the bulk density of wet cow dung is 1200 kg m^{-3}. If equal amount of water on volume basis is added to the dung for slurry preparation and the retension period is taken as 40 days, calculate the diameter of the digester tank.

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