Seat No: _____ **Enrollment No: _____**

PARUL UNIVERSITY

COLLEGE OF AGRICULTURE

B.Sc. (Hons.) Agriculture Summer 2021 - 22 Examination

Semester: 4 **Date: 09/03/2022**
Subject Code: 20106252 **Time: 10:30 am to 01:00 pm**
Subject Name: Renewable Energy & Green Technology **Total Marks: 50**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Do as Directed. **(05)**

A. Fill in the blanks. (Each of 0.5 marks)

1 Fossil fuels are a **_____** type of energy
2 Methanogens bacteria work better at **_____** temperature to produce maximum biogas.
3 The gas produced in the gasifier is a clean burning fuel having heating value of about _____ kcal/m^3
4 Biogas generally contains _____ % CO_2.
5 The conversion of biomass to heat and power by directly burning it, is called **_____** process.
6 The total solid contains in fresh cow dung is _____ .
7 Large size gasifiers have power generation capacity _____
8 Floating dome type biogas plant is named as _____ type of biogas plant also.
9 omass based producer gas is contained **_____** CO (carbon monoxide) and **_____** H_2 (Hydrogen).
10 Solar cell made of _____.

B. Multiple choice type questions. (Each of 0.5 marks) **(10)**

1. What is related to solar energy?

a) Petroleum **c)** Both
b) Solar Cell **d)** None

2. Common energy source in Indian villages is

a) Electricity **c)** Wood and animal dung
b) Coal **d)** Sun

3. A natural resource that can be replaced in same rate at which it is consumed or used is known a

a) Natural Resources **c)** Renewable Resources
b) Artificial Resources **d)** Non-renewable Resources

4. Both power and manure is provided by _____.

a) Nuclear plants **c)** Thermal plants
b) Biogas plants **(d)** Hydroelectric plant

5. 1 kg fresh cow dung produces _____ biogas

a) 0.08 m^3 **c)** 0.02 m^3
b) 0.1 m^3 **d)** 0.04 m^3

6. The main composition of biogas is _____

a) Methane **c)** Nitrogen
b) Carbon dioxide **d)** Hydrogen

7. Solar Photovoltaic system converts ……

a) Solar energy to thermal energy
b) Solar energy to heat energy
c) solar energy to mechanical energy
d) Solar energy to electrical energy

8. The most abundantly available fossil fuel in India is _____

a) Petroleum
b) Oil
c) Natural Gas
d) Coal

9. _____device / instrument is used to measure solar irradiance on a plane surface.

a) PYRHELIOMETER
b) PYRANOMETER
c) SOLARIMETER
d) SUN-SHINE RECORDER

10. Which of the following non-renewable energy is not classified under a fossil fuel?

a) Petroleum
b) Nuclear
c) Natural gas
d) Oil

Which solar gadget comprises the technology to convert sunlight directly into electricity?

a) Solar Flat Plate Collector
b) Solar parabolic concentrator
c) Solar Photovoltaic Cell
d) Solar water heater

12. The major non-renewable energy usage in India is_____

a) Coal
b) Petroleum and other liquids
c) Natural gas
d) Nuclear

13. …….. type of biogas plant has non-corrosion trouble

a) Floating dome type
b) Fixed dome type
c) KVIC type
d) All of above

14. How is geothermal energy harvested? (How do we get it?)

a) Solar panels collect the sunlight.
b) The heat from the earth boils water to create steam.
c) We pump it from the earth and refine it into gasoline.
d) Not any one from above

15. A Solar cell is an electrical device that converts the energy of light directly into electricity by the _____

a) Atmospheric effect
b) Physical effect
c) Chemical effect
d) Photovoltaic effect

16. What is one disadvantage of renewable energy?

a) Electricity and power could become much cheaper.
b) Many people could become energy independent.
c) Third world countries could have affordable energy.
d) Most sources are expensive to get started.

17. Wind is a

a) natural but non-renewable resource
b) artificial and non-renewable resource
c) natural and renewable resource
d). artificial but renewable resource

18. What is one disadvantage of coal?

There isn't a lot of coal left which makes it expensive.
b) Coal produces air pollution.
c) You can only use it to roast hot dogs and cook hamburgers.
d) The world isn't using a lot of coal which makes it an undesirable job.

19. KVIC is _____ biogas plant.

a) Floating drum type **c)** Both

b) Fixed dome type **d)** None

20. Which one is non-renewable resource?

a) Wind **c)** Biomass

b) Solar **d)** Petroleum

Q.2 Do as Directed.

A. Define the following. (Any five) **(05)**

1. Biogas
2. Gasifiers
3. Wind mill or wind turbine:
4. Pyrolysis
5. Densification
6. Gasification of Biomass
7. Solar cell {photovoltaic (PV)}

B. Answer the following. (Any Five) **(05)**

1. Define thermo-chemical conversion of biomass
2. State the stages of Biogas production
3. Write unit operations of Briquetting Process
4. State the function of energizer in solar fencing system
5. Difference between Briquetting and Pelleting
6. State any three factors effect on biogas production
7. State the function of Central Guide Frame in KVIC type biogas plant

Q.3 Write short notes. (Any five) **(10)**

1. Types of wind mills
2. Describe working of solar water pumping system
3. Factors Affecting Densification / Briquetting
4. What are the use of digested slurry obtained from biogas plant.
5. What are the important parameters affecting the fixed bed gasification ?
6. Explain classification of Energy sources
7. Enlist the type of fixed bed gasifier.

Q.4 Attempt any Three / Long Questions / Example **(15)**

1. State the Advantages in briquetting of biomass
2. State different components of Wind turbine and its function
3. Explain in details the Comparison between KVIC type and Janata type biogas Plants
4. Explain different components of biogas plant and its Function
5. Enlist different types of Biomass briquetting technologies and explain Screw press technology in details.