Total No. of Questions: 24

Enrollment No : _____

MEDICAPS UNIVERSITY

Faculty of Agriculture

End Semester Examination May 2025

AG3CO27 Renewable Energy & Green Technology

Programme	:	B. Sc. (Hons.)	**Branch/Specialisation**	:	AG
Duration	:	3 hours	**Maximum Marks**	:	50

Note: *All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary. Notations and symbols have their usual meaning.*

Section 1 (Answer all question(s))

Q1. The conventional source of energy is also called _____. **Marks 1 CO 1 BL 2**

Rubric	Marks
Finite energy	1

- (•) Finite energy
- ( ) Nonrenewable energy
- ( ) Renewable energy
- ( ) Infinite energy

Q2. _____ Process involves bacterial breakdown by micro-organisms. **Marks 1 CO 1 BL 2**

Rubric	Marks
Biological conversion	1

- ( ) Thermo-chemical conversion
- ( ) Combustion
- ( ) Burning
- (•) Biological conversion

Q3. Solar radiation received on the earth's surface without change in direction, is called_____. **Marks 1 CO 1 BL 2**

Rubric	Marks
Beam radiation	1

- (•) Beam radiation
- ( ) Diffuse radiation
- ( ) Ultraviolet radiation
- ( ) Infrared radiation

Q4. _____ measures global or diffuse radiation on a horizontal surface. **Marks 1 CO 2 BL 1**

Rubric	Marks
Pyranometer	1

- ( ) Pyrheliometer
- ( ) Sunshine recorder
- ( ) Data logger
- (•) Pyranometer

Q5. _____ is an organic carbon-based matter obtained from plants. **Marks 1 CO 2 BL 2**

Rubric	Marks
Biomass	1

- ( ) Biofuel
- ( ) Alcohol
- ( ) Biodiesel
- (•) Biomass

Q6. _____ collectors are used typically for temperature requirements up to 75°C. **1 2 2**

Rubric	Marks
Flat plate collector	1

- ○ Evacuated tube collector
- ○ Parabolic trough concentrator
- ◉ Flat plate collector
- ○ Paraboloidal collector

Q7. _____ is obtained by partial combustion of wood or any cellulose organic material of plant origin. **1 3 2**

Rubric	Marks
Producer gas	1

- ○ Biogas
- ◉ Producer gas
- ○ Charcoal
- ○ Biodiesel

Q8. _____ is densification of loose biomass into a high density solid fuel. **1 3 2**

Rubric	Marks
Biomass briquetting	1

- ○ Anaerobic digestion
- ○ Biomass gasification
- ◉ Biomass briquetting
- ○ Pyrolysis

Q9. Betz criterion for an 'ideal' turbine of _____. **1 3 2**

Rubric	Marks
16/27	1

- ◉ 16/27
- ○ 14/25
- ○ 12/23
- ○ 18/27

Q10. Wind speed varies considerably with height above ground; this is referred to as _____. **1 3 3**

Rubric	Marks
Wind shear	1

- ○ Wind loss
- ○ Wind strength
- ○ Wind power
- ◉ Wind shear

Section 2 (Answer all question(s))

Marks CO BL

Q11. Give the examples of renewable energy sources. **1 1 1**

Rubric	Marks
examples of renewable energy sources	1

Q12. Classify energy sources. **3 1 2**

Rubric	Marks
classification of energy sources	3

Q13. (a) How do various energy sources contribute to the agricultural sector's productivity and sustainability? **4 1 2**

Rubric	Marks
about energy sources	1
about contribution of energy sources to the agricultural sector's productivity and sustainability	3

(OR)

(b) Explain how renewable energy sources (like solar, wind, and hydro) contribute to global energy needs compared to traditional non-renewable sources?

Rubric	Marks
renewable energy sources (like solar, wind, and hydro) contribute to global energy needs compared to traditional non-renewable sources	4

Section 3 (Answer all question(s))

Marks CO BL

Q14. Define biomass. **2 1 2**

Rubric	Marks
definition of biomass	2

Q15. Classify gasifier. **2 1 2**

Rubric	Marks
classification of gasifier	2

Q16. (a) Explain the different stages involved during biogas production. **4 1 2**

Rubric	Marks
four stages involved during biogas production.	4

(OR)

(b) Explain the process of gasification.

Rubric	Marks
process of gasification with chemical reactions	4

Section 4 (Answer all question(s))

Marks CO BL

Q17. What are the different types of solar thermal collectors? **2 2 2**

Rubric	Marks
types of solar thermal collectors	2

Q18. (a) Explain the working of natural circulation solar water heater. **6 2 3**

Rubric	Marks
working of natural circulation solar water heater	4
diagram of natural circulation solar water heater	2

(OR)

(b) Explain the working of solar still.

Rubric	Marks
working of solar still	4
Diagram of solar still	2

Section 5 (Answer all question(s))

Marks CO BL

Q19. How heat energy is produced in solar pond? **2 3 3**

Rubric	Marks
production of heat energy in solar pond	2

Q20. Write down the applications of solar photovoltaic system. **2 3 3**

Rubric	Marks
applications of solar photovoltaic system.	2

Q21. (a) Explain the working of solar photovoltaic system. **4 3 3**

Rubric	Marks
working of solar photovoltaic system	4

(OR)

(b) Explain the working of solar dryer.

Rubric	Marks
working of solar dryer.	4

Section 6 (Answer any 2 question(s))

Marks CO BL

Q22. How various factors affect the distribution of wind energy? **4 3 3**

Rubric	Marks
factors affect the distribution of wind energy	4

Q23. Explain the wind energy conversion system. **4 3 3**

Rubric	Marks
wind energy conversion system	4

Q24. Derive the expression for energy available in the wind. **4 3 3**

Rubric	Marks
expression for energy available in the wind	4

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