STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted during the academic year 2016-17& thereafter)

SUBJECT CODE: 16VS/VM/BE36

B.Voc. DEGREE EXAMINATION, NOVEMBER 2021
SUSTAINABLE ENERGY MANAGEMENT

COURSE : MAJOR CORE
PAPER : BIO ENERGY
TIME : 3 HOURS **MAX. MARKS: 100**

SECTION – A (20 MARKS)

ANSWER ALL QUESTIONS: (10 X 1 =10)

I CHOOSE THE CORRECT ANSWER:

1. The total solid represents the percentage of biomass excluding the _____
   a) Moisture content b) Chemical composition
   c) Concentration d) Volatile matter
2. The digested slurry has more _____ producing bacteria
   a) Acid b) Methane
   c) Nutrient d) both a & b
3. Moisture in a biomass lowers the heating _____ of the biomass
   a) Rate b) Percentage
   c) Value d) Efficiency
4. Fuel produced from municipal solid waste by incineration is _____
   a) RDF b) Biodiesel
   c) FRP d) Hydrogen
5. The gas that emanates from combustion plants
   a) Biogas b) Flue gas c) Landfill gas d) methane

II FILL IN THE BLANKS:

6. The amount of heat released is called by_____ of a fuel.
7. The optimum C/N ratio for biogas production _____
8. The end product of very slow pyrolysis of wood is _____
9. _____ is the polymer of glucose.
10. The _____ component of wood is hard to digest in a biogas plant

ANSWER ALL QUESTIONS: (5 X 2 =10)

III ANSWER IN A SENTENCE:

11. Carbonization

12. Producer gas

13. Equation for methanol synthesis

14. Advantages of KVIC model biogas plant

15. Anaerobic Fermentation of biomass

SECTION - B

ANSWER ANY TWO QUESTIONS: (2×15 = 30)

16. Write the classification of biomass resources with examples

17. Write the composition of the followings

    a. Landfill gas b.Wood gas c.Bio gas

18. Explain in detail about the landfill collection system with a neat schematic diagram

19. Determine the density of the following biomasses and identify the woody biomass among the given biomass.

Biomass	Weight in g	Volume in ml
Algae	18	40
Kelp	50	45
Bottle guard	14	25
Coconut shell	19	22

SECTION – C

ANSWER ANY TWO QUESTIONS: (2×25 =50)

20. Find the total solid percentage of the given biomasses and compare the results

Biomass	Initial weight of the biomass in grams	Final weight of the biomass in grams
Potato	20	16
Water melon	20	5
Mint leaves	20	12
Banana Peels	20	10

21. a. Write a short note on ultimate analysis

    b. Find the fixed carbon value of the given biomasses

Biomass	**Moisture content in %**	**Volatile matter in %**	**Ash content in %**
Cabbage	51	48	0.6
Onion	49	45	0.7

22. a. Explain the significance of bioenergy

    b. Write short note on aquatic biomass

23. a. Write short note on PRAGATI model of a biogas plant

    b. Explain in detail the uses of biochar

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