

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86**  
**(For candidates admitted during the academic year 2016–17 & thereafter)**

**SUBJECT CODE: 16VS/VM/BE36**

**B.Voc. DEGREE EXAMINATION, NOVEMBER 2017**  
**SUSTAINABLE ENERGY MANAGEMENT**  
**THIRD SEMESTER**

**COURSE : MAJOR CORE**  
**PAPER : BIO ENERGY**  
**TIME : 6 HOURS**

**MAX.MARKS:100**

**SECTION – A**

**ANSWER ALL QUESTIONS:**

**(20x1=20)**

1. Cellulose, \_\_\_\_\_ and Lignin are the major constituents of the biomass.
2. \_\_\_\_\_ is an example of herbaceous biomass.
3. The end product of very slow pyrolysis of wood is \_\_\_\_\_.
4. Plants produce energy by the process of \_\_\_\_\_ .
5. Anaerobic fermentation occurs in the \_\_\_\_\_ of air. (Presence/Absence)
6. Moisture in biomass \_\_\_\_\_ the combustion of biomass. (Improves/Retards)
7. The chemical formula for methane is \_\_\_\_\_.
8. Proximate Analysis estimates the \_\_\_\_\_ of a biomass.
9. Ultimate Analysis estimates the \_\_\_\_\_ of a biomass.
10. \_\_\_\_\_ is the polymer of glucose.
11. What is biogas?
12. Identify the biomass
  - a) Food waste and wood
  - b) tin can and glass
  - c) Polyethene bags
  - d) Rubber sheet
13. Proximate Analysis estimates the \_\_\_\_\_ of a biomass.
  - a) Calorific value (CV)
  - b) Latent heat
  - c) Fixed Carbon (FC)
  - d) Mass
14. Slow pyrolysis of wood produces
  - a) Biogas
  - b) Charcoal
  - c) Biofuel
  - d) None of the above
15. What is a wood gas/ producer gas?
16. Anaerobic fermentation occurs in the absence of air. (T/F)
17. Moisture in biomass improves the combustion of biomass.(T/F)
18. The chemical formula for methane is CH<sub>4</sub>. (T/F)
19. What is pyrolysis?
20. What is carbonization?

**SECTION – B****ANSWER ANY SIX QUESTIONS:****(6x3=18)**

21. Write short notes on Deenabandhu model of biogas plant.
22. Write short notes on Liquefaction.
23. Write the classification of biomass with few examples.
24. Write short notes on aquatic biomass.
25. Write short notes on proximate analysis.
26. What is the significance of bioenergy?
27. What are the different end products of pyrolysis at different heating rates?
28. Explain briefly the pyrolysis of wood.
29. Compare the energy densities of Wood gas, Pyrolytic Liquids and Methanol.
30. Elaborate the floating drum type biogas plant.

**SECTION – C****ANSWER ANY TWO QUESTIONS:****(2x6=12)**

31. What are the advantages and disadvantages of floating dome type biogas model?
32. What is Biochar? Explain in detail the uses of Biochar.
33. Explain in detail about the Landfill gas collection system with a neat schematic diagram.
34. Explain in detail the ultimate analysis of biomass.

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