



KERALA AGRICULTURAL UNIVERSITY
B.Tech. (Ag. Engg.) 2016 Admission
V Semester Final Examination-January 2019

Fpme.3111

Bio-Energy Systems: Design and Applications (1+1)

Marks: 50

Time: 2 hours

I Fill up the following (10x1=10)

- 1 Producer gas mainly consists of _____ and _____ combustible gases.
- 2 pH requirement in a biogas digester is between _____ and _____
- 3 Optimum C:N ratio for biogas production should be _____
- 4 Thermal decomposition of organic compounds in the absence of air is called _____
- 5 Biogas is a mixture of mainly _____ and _____ gases.

State True/False

- 6 Production of biogas through anaerobic digestion is independent of temperature.
- 7 Retention time for production of biogas is more in winters than in summers.
- 8 Downdraught gasifiers are recommended for engine operation.
- 9 Biogas is released at variable pressure in fixed dome type biogas plants.
- 10 The nutrient content (N,P,K) in biogas spent slurry is higher than Farm Yard Manure.

II Write Short notes on any FIVE of the following (5x2=10)

- 1 Combustion
- 2 Gasification
- 3 Pyrolysis
- 4 Anaerobic digestion
- 5 Trans-esterification
- 6 Photosynthesis
- 7 Bio-photolysis

III Answer any FIVE of the following. (5x4=20)

- 1 Mechanics of biomethanation.
- 2 Factor affecting biogas production.
- 3 Chemistry of gasification of biomass.
- 4 Biomass characterization.
- 5 Process of biodiesel production.
- 6 Working principle of fuel cell.
- 7 Process of biomass briquetting.

IV Answer any ONE of the following (1x10=10)

- 1 Digester design considerations and selection of site for biogas plant.
- 2 Gasifier based Power Generating System.
