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.

****