

**KERALA AGRICULTURAL UNIVERSITY**  
**B.Tech (Agrl. Engg) 2013 Admission**  
**V<sup>th</sup> Semester Final Examination-January -2016**

Cat. No: Fpme.3114

Marks: 50.00

**Title: Renewable Energy Sources (2+1)**

**Time: 2 hours**

**I Fill up the blanks**

**(10 x 1=10)**

1. When silicone is doped with phosphorous , then semi -conductor material is \_\_\_\_\_ type
2. "At solar noon value of hour angle is \_\_\_\_\_
3. Any two combustible portion of the producer gas are \_\_\_\_\_ and \_\_\_\_\_
4. \_\_\_\_\_ is a point on the celestial sphere directly over the observer's head
5. The duration of bright sunshine in a day is measured by means of \_\_\_\_\_
6. Solidity ratio is the ratio between \_\_\_\_\_ and \_\_\_\_\_
7. The ratio between \_\_\_\_\_ and \_\_\_\_\_ is called tip speed ratio
8. The value of Betz coefficient is \_\_\_\_\_
9. Optimum total solid for biogas production is \_\_\_\_\_
10. One kg of cow dung produce \_\_\_\_\_ m<sup>3</sup> of biogas

**II Write short notes on any FIVE questions**

**(5 x 2=10)**

1. Describe the construction and working of a box type solar cooker
2. Mention the advantages and disadvantages of solar photovoltaic system
3. Write down the applications of solar air heaters
4. Brief the working principle of salt gradient solar pond
5. Classify wind energy conservation systems
6. Detail the factors to be considered for the selection of site for a biogas plant
7. Write the working principle of single basin tidal energy conversion system

**III Write short essay on any FIVE questions**

**(5 x 4=20)**

1. What is principle of working of a most common type pyranometer? Describe Eppley pyranometer
2. Describe the construction and working of a solar cabinet drier
3. Construction and working of Deenabhandhu biogas plant with neat diagram
4. Explain the factors affecting biogas production
5. Detail the biomass conversion technologies

6. Explain the working principles of wind turbines .Describe savonius rotor and mention its characteristics and advantages
7. Explain the working of open cycle geothermal energy conversion system with flowchart

**III Write essay on any ONE**

(1 x 10=10)

1. What is thermo-chemical gasification? Mention the type of gasifiers .Explain the principles of operation ,chemical reactions and the utilization of producer gas
2. What are the basic principles of solar thermal energy collecting devices? How are they classified? Give an account of different types with the help of neat diagrams