



## End Semester Examination – Nov/Dec – 2016

**Code : 14EE2032**  
**Sub. Name : Renewable Energy II**

**Semester : 2016-17 ODD**  
**Duration : 3hrs**  
**Max. marks : 100**

### ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

| Q. No.                    | Sub Div. | Questions  | Course Outcome | Marks |
|---------------------------|----------|--|----------------|-------|
| 1.                        | a.       | Explain the process of photosynthesis. How much energy is stored through this process? In what range of frequency spectrum is solar light photosynthesis most marked?  | CO1            | 10    |
|                           | b.       | List down the different biomass energy resources and what is the energy yield from each of them?   | CO1            | 10    |
| (OR)                      |          |  |                |       |
| 2.                        | a.       | Discuss the biomass conversion technologies:<br>i) Physical Method      ii) Incineration<br>iii) Thermochemical      iv) Biochemical   | CO1            | 20    |
| 3.                        | a.       | Explain the process of gasification of solid bio-fuels. What is the general composition of the gas produced and what is its heating value? What are its main application?  | CO1            | 10    |
|                           | b.       | With help of neat diagram explain the working of biomass gasifier. What further processing is required to use the gas produced in the diesel engine?   | CO1            | 10    |
| (OR)                      |          |  |                |       |
| 4.                        | a.       | Calculate i) the volume of a biogas digester suitable for the output of four cows, and ii). the power available from the digester . Retention time is 20 days, at temperature 30 <sup>0</sup> celsius, dry matter consumed 2kg/day, biogas yields 0.24 m <sup>3</sup> per kg. Burner efficiency is 60%, methane proportion is 0.8. H <sub>m</sub> is the heat of combustion of methane may be assumed to be 28MJ/ m <sup>3</sup> at STP. | CO1            | 10    |
|                           | b.       | What are the factors affecting the performance of a biogas digester?   | CO1            | 10    |
| 5.                        | a.       | With help of neat diagram, explain the floating drum and fixed dome biogas plants. Give the comparison between floating drum biogas plants and fixed dome biogas plants.   | CO1            | 15    |
|                           | b.       | Discuss the materials used and site selection for constructing the biogas plants.  | CO1            | 5     |
| (OR)                      |          |  |                |       |
| 6.                        | a.       | Draw a conceptual block diagram of a fuel-cell power plant and explain the details of each block.  | CO2            | 10    |
|                           | b.       | Explain the principle of operation of an alkaline fuel cell and discuss the merits and demerits.   | CO2            | 10    |
| 7.                        | a.       | Describe a vapour dominated systems or dry steam fields in geothermal resources  | CO2            | 10    |
|                           | b.       | Discuss the different types of water turbines used in hydro power plant.   | CO2            | 10    |
| (OR)                      |          |  |                |       |
| 8.                        | a.       | With neat diagrams explain the ocean thermal energy conversion technology.   | CO2            | 10    |
|                           | b.       | Derive the expression for finding the energy content and energy extraction in hot dry rock resources of geothermal resources.  | CO2            | 10    |
| <b><u>Compulsory:</u></b> |          |  |                |       |
| 9.                        | a.       | Comment on the possibilities of hydrogen as a potential energy carrier in future.  | CO2            | 5     |
|                           | b.       | Explain various methods of production of hydrogen for use as energy carrier.   | CO2            | 15    |

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