Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **14EE2032** | **Duration :** | **3hrs** |
| **Sub. Name :** | **RENEWABLE ENERGY - II** | **Max. Marks :** | **100** |

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Elaborate on various biomass resources available. | CO1 | 6 |
| b. | With a neat diagram, explain the construction and working of Up draught and Down draught fixed bed gasifier. | CO1 | 14 |
| (OR) | | | | |
| 2. | a. | List any ten factors that affect the process of bio-digestion. Explain each one of them. | CO1 | 10 |
| b. | Discuss on the various biomass conversion technologies available in detail. | CO1 | 10 |
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| 3. | a. | Compare and contrast on fixed dome and floating drum type biogas plant. | CO1 | 6 |
| b. | Elaborate on the construction and working of Deen Bandhu Biogas plant. Also mention how it is different from Janta Biogas plant. | CO1 | 14 |
| (OR) | | | | |
| 4. | a. | Design a community biogas plant for the given specifications. A village consists of 20 families and each family has six persons. The following are the cattles available with them in total.   |  |  |  | | --- | --- | --- | | Type of  Cattle | Total Quantity | Quantity of dung available per cattle in kg/day | | Cow | 10 | 10 | | Ox | 5 | 12 | | Pig | 2 | 2 | | Buffalo | 8 | 15 |   The collected dung can produce 0.42m3/kg of biogas. Assume the density of slurry as 1090 kg/m3 and the retention period as 30 days. | CO1 | 20 |
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| 5. | a. | With a neat sketch, explain the production of hydrogen using Electrolysis process. | CO2 | 10 |
| b. | Elucidate Westing house Electrochemical Thermal Sulfur cyclic process of hydrogen production with necessary diagrams. | CO2 | 10 |
| (OR) | | | | |  | (OR) |
| 6. | a. | Explain the means by which hydrogen can be transported from one place to another. | CO2 | 10 |
| b. | Name the five principle methods for storing hydrogen. Explain them briefly. | CO2 | 10 |
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| 7. | a. | Draw the sketch of a Polymer Electrolyte Membrane Fuel Cell (PEMAFC) and explain its components and working with necessary equations. | CO2 | 10 |
| b. | Derive the expression for the efficiency of a fuel cell with help of thermodynamics laws. | CO2 | 10 |
| (OR) | | | | |  | (OR) |
| 8. | a. | Draw the VI characteristics of a fuel cell and explain the reasons for the drop in output voltage from ideal emf. | CO2 | 10 |
| b. | Sketch the layout of typical micro-hydro power station and explain the functionality of each component. | CO3 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Explicate the working of Vapour-Dominated (Dry Steam) system in extracting geothermal energy with a neat diagram. | CO3 | 10 |
| b. | Explain any two wave energy conversion devices in detail. | CO3 | 10 |