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

****

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

|  |  |  |  |
| --- | --- | --- | --- |
| **Code :** | **14EE2031** | **Duration :** | **3hrs** |
| **Sub. Name :** | **RENEWABLE ENERGY – I** | **Max. Marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q.**  **No.** | **Sub**  **Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Elucidate the solar spectrum. | CO1 | 8 |
| b. | Clarify measuring and capturing of sunlight in detail. | CO1 | 12 |
| **(OR)** | | | | |
| 2. | a. | Describe the mathematical model of PV cells in double diode model. | CO2 | 12 |
| b. | Summarize the properties of PV circuits. | CO2 | 8 |
|  | | | | |
| 3. | a. | List the factors affecting PV cell efficiency. | CO1 | 6 |
| b. | State the role of charge controller in solar PV system. | CO2 | 6 |
| c. | Write the necessity and benefits of MPPT system. | CO1 | 8 |
| **(OR)** | | | | |
| 4. | a. | Compare lead-acid battery with lithium-ion battery. | CO2 | 10 |
| b. | Explicate various power electronic topologies in PV system. | CO2 | 10 |
|  | | | | |
| 5. | a. | Compare VAWT with HAWT. | CO3 | 10 |
| b. | State blade elementary theory. | CO3 | 4 |
| c. | How Betz limit is used for wind power generation? | CO3 | 6 |
| **(OR)** | | | | |
| 6. | a. | Summarize the behavior stand-alone system. | CO3 | 8 |
| b. | List the problems occurred in grid connected wind system. | CO3 | 8 |
| c. | Mention the benefits and applications of wind power. | CO3 | 4 |
|  | | | | |
| 7. | a. | Derive the expression for power extraction by the turbine. | CO3 | 8 |
| b. | Elucidate axial force and torque calculated from linear momentum theory. | CO3 | 12 |
| **(OR)** | | | | |
| 8. | a. | Infer the reasons for erecting of wind mills in land and offshore. | CO3 | 10 |
| b. | What are the factors observed from wind tunnel and how it is used with turbine? | CO3 | 10 |
|  |  | **Compulsory:** | | |
| 9. | a. | Illustrate any one hybrid system in detail with case study. | CO3 | 10 |
| b. | Discuss the characteristics of the wind. | CO3 | 10 |