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



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

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| **Code :** | **14EE2018** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ENERGY SYSTEMS** | **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. | Draw the block diagram of Stand-alone photovoltaic system and explain its components and operation. | CO1 | 12 |
| b. | Discuss on the formation of wind and types of wind. | CO1 | 8 |
| **(OR)** | | | | |
| 2. | a. | With neat diagram, explain the working of Flat plate solar collector. | CO1 | 12 |
| b. | Mention the factors to be considered for selecting a site for Hydro Power plant. Explain briefly each one of them. | CO1 | 8 |
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| 3. | a. | With the help of neat diagram, explain the construction of Horizontal Axis Wind Turbine (HAWT). | CO1 | 12 |
| b. | Compare and contrast Horizontal Axis with Vertical Axis Wind Turbine. | CO1 | 8 |
| **(OR)** | | | | |
| 4. | a. | Sketch the layout of Tidal Power plant and explain the operation of single basin arrangement. | CO1 | 12 |
| b. | List down the important factors to be considered while selecting a site for thermal power plant. Briefly explain them. | CO1 | 8 |
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| 5. | a. | With necessary diagram, explain the dry steam plants in extracting geothermal energy and also discuss the harmful effects of geothermal energy. | CO1 | 12 |
| b. | Discuss briefly on the effect of distributed generation on power system operation. | CO2 | 8 |
| **(OR)** | | | | |
| 6. | a. | Draw the layout of a Nuclear power plant and explain how electricity is generated in the plant. | CO1 | 12 |
| b. | Compare Nuclear Fission with Nuclear Fusion using necessary chemical equations. | CO1 | 8 |
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| 7. | a. | A Consumer consumes 1 X 106 kWh per year and his yearly load factor is 40%. The tariff is Rs.100 per kW per year + Rs.1 per unit. Determine the savings in his energy cost annually if he improves his load factor to 100%. | CO2 | 12 |
| b. | Discuss various cost that go into the generation of electrical energy. | CO2 | 8 |
| **(OR)** | | | | |
| 8. | a. | Mention why Power factor tariff is imposed. Clearly explain the procedure for finding out the capacity of the shunt capacitor required for improvement of power factor. | CO2 | 12 |
| b. | A domestic lighting installation having fifteen, 80 Watt lamps operated as follows:  5 lamps from 6 p.m till 10 p.m  10 lamps from 10 p.m till 6 a.m  6 lamps from 6 a.m to 6 p.m  Determine the connected load, the maximum demand, the demand factor and the daily load factor. | CO2 | 8 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Illustrate with an example, the steps involved in conducting energy audit. | CO1 | 12 |
| b. | Discuss the major causes for harmonics and mention their effects. Also show how to reduce the level of harmonics in the power system. | CO2 | 8 |