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

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**End Semester Examination – Nov/Dec– 2018**

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| **Code :** | **17ME3037** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SOLAR ENERGY UTILIZATION** | **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. | Why heat exchanger required in solar thermal power generation. | CO1 | 5 |
| b. | Explain the solar thermal power generation using different mediums with temperature balance. | CO1 | 15 |
| (OR) | | | |  |
| 2. |  | Explain the different solar radiation measuring devices and their differences. | CO1 | 20 |
|  |  |  |  |  |
| 3. | a. | Compare the flat plate and evacuated tube heat collectors. | CO2 | 8 |
| b. | What are the different types of collector losses and express the collector efficiency equation. | CO3 | 12 |
| (OR) | | | |  |
| 4. |  | Compare the concentrating collectors over flat plate type collectors. | CO2 | 20 |
|  |  |  |  |  |
| 5. | a. | Why orientation is needed in concentrating type collectors. | CO3 | 10 |
| b. | Describe the different methods of sun tracking. | CO3 | 10 |
| (OR) | | | |  |
| 6. |  | Explain the different types of concentrating collectors. | CO3 | 20 |
|  |  |  |  |  |
| 7. | a. | Write the differences of active and passive solar hot water systems. | CO3 | 8 |
| b. | Explain any one type of active solar hot water system. | CO3 | 12 |
| (OR) | | | |  |
| 8. | a. | What are the methods to store solar water heat with maximum time? | CO3 | 8 |
| b. | Explain about the non convective solar pond. | CO3 | 12 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Draw and explain circuit model of Solar PV cell. | CO4 | 6 |
| b. | Calculate the maximum power, efficiency, fill factor by a solar cell at an intensity of 200 W/m2. Given Voc= 0.24V , Isc=9mA, Vmax=0.14V, and Imax=6mA. | CO6 | 8 |
| c. | What is the Solar tower,  For given each solar cell of 0.6 V open circuit voltage, and 3mA of short circuit current, Estimate series and parallel array for generating 50V and 1A. | CO5 | 6 |