**TU/ CODL**

**TEZPUR UNIVERSITY**

**SEMESTER END EXAMINATION (AUTUMN ) 2019**

**DRE 102: SOLAR ENERGY**

**Time: 3 Hours Total Marks: 70**

*The figures in the right-hand margin indicate marks for the individual question.*

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1. Choose the correct answer 1×10=10

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| --- | --- |
| a. | The value of solar constant is (approximately)   1. 0900 Wm-2. 2. 1053 Wm-2. 3. 1149 Wm-2. 4. 1366 Wm-2. |
| b. | The maximum declination angle of sun can be (in degrees)   1. 21.75 2. 13.65 3. 27.25 4. 23.45 |
| c. | Which is NOT a type of solar cell   1. Monocrystalline Silicon 2. Amorphous Silicon 3. Amorphous Boron 4. Cadmium Telluride |
| d. | The band gap of silicon is   1. 1.9 eV 2. 1.1 eV 3. 2.1 eV 4. 0.7 eV   **P.T.O** |
|  |  |
| e. | Which is the correct statement   1. Few PV module connected in series called solar cell 2. Few PV array connected in parallel called PV module 3. Few Solar cell connected in series called PV module 4. Few PV module connected in parallel called solar cell |
| f. | Pyrheliometer can measure   1. Spectrum 2. Global Solar Radiation 3. Direct Solar Radiation 4. Air Pressure |
| g. | Which is not a type of energy storage?   1. Electrochemical storage 2. Latent heat storage 3. Pyroelectric storage 4. Flywheel energy storage |
| h. | Fill up the blank: In an electrical generator \_\_\_\_\_ energy is converted into electrical energy.   1. Mechanical 2. Chemical 3. Light 4. Biomass |
| I. | Which is NOT a type of battery?   1. Lead Acid 2. Nickel Cadmium 3. Aluminium Bromide 4. Zinc Air |
| j. | The function of an inverter in a PV system is to   1. Convert DC to AC 2. Regulate DC 3. Step-down AC 4. Boost DC |

2. Write short note on the following 3×4=12

1. Azimuth angle
2. Solar Time and local time
3. Solar detoxification
4. Passive solar heating

3. Answer the following questions

1. Explain the typical vapor compression refrigeration cycle. 6
2. Discuss with a schematic, the modification to be made for converting typical vapor compression cycle to a solar driven absorption cycle. 4
3. Mention the different classification and types for thermal storage of solar energy. 6

4. Answer the following questions

1. What is a solar cell? 2
2. Describe working principle of a solar cell. 5
3. Mention the primary components of a solar photovoltaic system with their requirements in photovoltaic system. 5

5. Mention the names of six BOS (Balance of System) components of

a photovoltaic system. 3

6. Mention the four condition to be satisfied for grid integration of

photovoltaic system. 4

7. Mention five desired features of inverters uses in standalone PV

system. 5

8. Discuss the discharging and charging operation of a battery. 8

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