

Unit 2 - Week 1

Course outline

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Week 1

- Introduction
- Solar Energy Harvesting
- Perovskite Solar Cells
- Solar Thermal Energy
- Heat Transfer Fluids
- Quiz : Assignment 1
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Assignment 1

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-08-14, 23:59 IST.

1) _____ creates temporary voltage and _____ creates permanent voltage, when there is a temperature gradient in materials. 1 point

- Pyroelectric effect, Thermoelectric effect
- Thermoelectric effect, Pyroelectric effect
- Pyroelectric effect, Triboelectric effect
- Piezoelectric effect, Thermoelectric effect

No, the answer is incorrect.
Score: 0

Accepted Answers:
Pyroelectric effect, Thermoelectric effect

2) The capacity of a battery is expressed in terms of 1 point

- Current rating
- Voltage rating
- Ampere-hour rating
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Ampere-hour rating

3) What is the percentage of installed capacity of solar energy as on 30th September, 2018 according to MNRE data? 1 point

- 7.46%
- 9.93%
- 21.41%
- 13.03%

No, the answer is incorrect.
Score: 0

Accepted Answers:
7.46%

4) Which of the following is the selection criteria for choosing nanomaterials for solar energy harvesting applications? 1 point

- Bandgap (1.0 to 1.8 eV) to harvest maximum sunlight
- High charge transport property
- Excellent stability
- All of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of these

5) In vapor assisted solution process of perovskite solar cell fabrication, which of the following material is deposited in vapor phase? 1 point

- PbX₂ alone
- MAX alone
- TiO₂ alone
- Both PbX₂ and MAX

No, the answer is incorrect.
Score: 0

Accepted Answers:
MAX alone

6) Select the correct statement from the following options 1 point

- Electron transport layer (ETL) is used to collect and transport holes
- Hole transport layer (HTL) is used to collect and transport electrons
- Electron transport layer (ETL) is used to collect and transport electrons
- None of these

No, the answer is incorrect.
Score: 0

Accepted Answers:
Electron transport layer (ETL) is used to collect and transport electrons

7) The mechanism involved in solar thermal energy harvesting technology is ____ 1 point

- Sunlight first converts into heat and then electricity
- Sunlight directly converts into electricity
- Electricity is converted into heat
- Heat is converted into light energy

No, the answer is incorrect.
Score: 0

Accepted Answers:
Sunlight first converts into heat and then electricity

8) Match the following type of collectors in section 'A' with their operational temperatures in section 'B' 1 point

Section A	Section B
1. Flat plate collectors	A. High temperatures (> 400 °C)
2. Fresnel collectors	B. Low temperatures (< 100 °C)
3. Central tower collectors	C. Medium temperatures (100 – 400 °C)

- 1-B, 2-A, 3-C
- 1-C, 2-B, 3-C
- 1-B, 2-C, 3-A
- 1-A, 2-C, 3-B

No, the answer is incorrect.
Score: 0

Accepted Answers:
1-B, 2-C, 3-A

9) Thermal conductivity of the base fluid can be enhanced by _____ 1 point

- Adding low thermal conductivity nanoparticles to it
- Adding high thermal conductivity of nanoparticles to it
- Adding nanoparticles doesn't enhance the thermal conductivity of base fluids
- Adding low thermal conductivity macro particles to it

No, the answer is incorrect.
Score: 0

Accepted Answers:
Adding high thermal conductivity of nanoparticles to it

10) The formula given by Pak & Cho's to find the density of nanofluids (ρ) is ____ 1 point

Where: ρ_f & ρ_p : densities of base fluid and nanoparticles respectively
 ϕ : Volume fraction nanoparticles in base fluids

- $\rho = (1 + \phi)\rho_f + \phi\rho_p$
- $\rho = (1 - \phi)\rho_f + \phi\rho_p$
- $\rho = (1 - \phi)\rho_f - \phi\rho_p$
- $\rho = (1 + \phi)\rho_f - \phi\rho_p$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\rho = (1 - \phi)\rho_f + \phi\rho_p$