

Unit 5 - Week 3: Solar Radiation Estimation

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Assignment 3

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

Due on 2020-10-07, 23:59 IST.

1) The global radiation reaching a horizontal surface on the earth is given by: 1 point

- a. Hourly beam radiation + hourly diffuse radiation
 b. Hourly beam radiation – hourly diffuse radiation
 c. Hourly beam radiation / hourly diffuse radiation
 d. Hourly diffuse radiation / hourly beam radiation

No, the answer is incorrect.
Score: 0

Accepted Answers:
a. Hourly beam radiation + hourly diffuse radiation

2) Total radiation incident on an inclined surface consists of the following components: 1 point

1. Beam radiation
 2. Diffuse radiation
 3. Radiation reflected from ground and surrounding

Select the correct answer using the code given below:

- a. 1 only
 b. 1 and 2 only
 c. 1, 2 and 3
 d. 2 and 3 only

No, the answer is incorrect.
Score: 0

Accepted Answers:
c. 1, 2 and 3

Common data for Q3-Q6

Solar radiation incident was observed on a horizontal surface at Delhi (28°38' N, 77°13' E) during the month of March. The average sunshine hours per day for the month may be assumed as 7.5 hours and the daily extra-terrestrial radiation on March 16 may be taken as the average radiation for the whole month. Use the following expression for calculation of monthly average of extra-terrestrial radiation.

$$\bar{H}_e = 3600 \times I_{sc} \times \frac{24}{\pi} \left[1 + 0.033 \cos \frac{360n}{365} \right] \left[\omega_2 \sin \phi \sin \delta + \cos \phi \cos \delta \sin \omega_2 \right]$$

3) The hour angle (in radian) at sunrise (or sunset) is: 1 point

- a. 1.546
 b. 1.495
 c. 1.346
 d. 1.476

No, the answer is incorrect.
Score: 0

Accepted Answers:
a. 1.546

4) Monthly average of the maximum possible sunshine hours (in hours) per day is: 1 point

- a. 11.454
 b. 10.823
 c. 11.823
 d. 10.454

No, the answer is incorrect.
Score: 0

Accepted Answers:
c. 11.823

5) For the month of March, monthly average of the daily extra-terrestrial radiation (in kilo Joule per sq. meter) on the horizontal surface at Delhi is: 1 point

- a. 32554.24
 b. 31784.37
 c. 34587.12
 d. 37595.19

No, the answer is incorrect.
Score: 0

Accepted Answers:
b. 31784.37

6) The monthly average daily global radiation (in kilo Joule per sq. meter) on the horizontal surface is: 1 point

- a. 19438.79
 b. 20438.79
 c. 21865.28
 d. 20045.28

No, the answer is incorrect.
Score: 0

Accepted Answers:
a. 19438.79

7) At solar noon, the hour angle is: 1 point

- a. +90°
 b. -90°
 c. Zero
 d. +180°

No, the answer is incorrect.
Score: 0

Accepted Answers:
c. Zero

Common data for Q8-Q11

During the month of October at 1100-1200 hours (LAT), solar radiation incident was observed at Chennai (13°00' N) on a flat plate collector facing south ($\gamma = 0$) with a slope of 15 degree. Consider the mean global radiation and the mean diffused radiation incident on the inclined surface to be 2408 kilo Joule per sq. meter per hour and 1073 kilo Joule per sq. meter per hour respectively. Assume the ground reflectivity to be 0.2. The representative day is 15th October.

8) Tilt factor for beam radiation is: 1 point

- a. 0.9385
 b. 1.1200
 c. 1.1854
 d. 1.2535

No, the answer is incorrect.
Score: 0

Accepted Answers:
b. 1.1200

9) Tilt factor for diffuse radiation is: 1 point

- a. 1.1251
 b. 0.8792
 c. 0.9830
 d. 1.2245

No, the answer is incorrect.
Score: 0

Accepted Answers:
c. 0.9830

10) Tilt factor for reflected radiation is: 1 point

- a. 0.0034
 b. 0.1274
 c. 0.0125
 d. 0.0078

No, the answer is incorrect.
Score: 0

Accepted Answers:
a. 0.0034

11) The monthly average hourly radiation (in kilo Joule per sq. meter hour) falling on the flat plate collector is: 1 point

- a. 2558
 b. 2958
 c. 2758
 d. 2358

No, the answer is incorrect.
Score: 0

Accepted Answers:
a. 2558

12) The ratio of the beam radiation flux falling on a tilted surface to that falling on a horizontal surface is called: 1 point

- a. Radiation shape factor
 b. Tilt factor
 c. Slope
 d. None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
b. Tilt factor