**Renewable Energy Technology**

**Mid Term Assignment**

**Spring 20-21**

**Last date of submission: 13.03.21**

1. When installing a fixed flat-panel collector on a roof in Sylhet city (24.8949° N, 91.8687° E), what orientation (azimuth and tilt) should be chosen to maximize the total energy harnessed over the year?

1. Calculate the maximum and minimum solar elevation angles for Dhaka (23.8103° N,

90.4125° E).

1. What is the angle of incident of solar radiation on a horizontal surface at solar noon in Khulna city (22.8456° N, 89.5403° E) on the **A**th of July?

**A should be the first 2 digits of your ID. (eg. if your ID is 18-78253-2 then A = 18)**

1. What is the local solar time when it is 10h00 on the clock in Liverpool (53°N, 3°W)?

Liverpool uses Greenwich Mean Time with the standard time zone meridian at 0°W. Daylight saving time is not in effect in winter.

**Here, Gregorian Calendar Day (n) should be the last 2 digits of your ID. (eg. if your ID is 18-78253-2 then n = 32)**

1. Calculate the position (azimuth, elevation) of the Sun at 15h30 on the clock in Istanbul

(41°N,28°E). Istanbul uses Eastern European Time, with the standard time zone meridian at 30°E. Daylight saving time is in effect (summer time is one hour ahead of winter time).

**Here, Gregorian Calendar Day (n) should be the last 2 digits of your ID. (eg. if your ID is 18-78253-2 then n = 32)**

1. If the dark saturation current of a solar cell is 1.7×10-8A/m2, the cell temperature is 27°C, the short-circuit current density is 250A/m2, and the voltage at maximum power is 0.47V, calculate the open circuit voltage, Voc; current density at maximum power, Imax; maximum power, Pmax; and maximum efficiency, ηmax. What cell area is required to get an output of 20 W when the available solar radiation is 820 W/m2?













