VIT®

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

SCHOOL OF MECHANICAL ENGINEERING

Continuous Assessment Test - I

M. Tech/B. Tech, Winter Semester-2019-20

Class Nbr. : VL2018195005634

Course Code : MEE5006 **Duration** : 90 Minutes.

Course Name : Solar Energy Technologies **Max. Marks** : 50

Faculty-In-Charge: Dr. Arun Kumar Behura **Slot** : A1+TA1

NOTE:

1. *Attested solar energy data sheet* may be permitted.
2. *All questions are compulsory.*

1. **Define and explain about solstices and equinox with neat sketch. [5]**
2. **Calculate the day length on May 1 and December 1 for a south-facing surface tilted at an angle of 40^0 and located at New Delhi ($28^0$35' N, $77^0$12' E). [5]**
3. **Calculate the hour angle at sunrise and sunset on a plane surface tilted at an angle of 40^0. Given $\emptyset$=28^0 N, δ=-21^0 and γ=48^0. [5]**
4. **Describe about the equator, prime meridian and other circles & zones on the globe with neat sketch. [5]**
5. **Find the Sun rise time and Sun Set time, day length @ VIT University on 10th May 2018 at 10:30 A.M. Take the latitude and longitude @ VIT is, Latitude (Ø) = 12.98^0 N, Longitude = 79.133^0 E, tilt angle is 12.6^0 (towards south) and also determine hour angles, incident angle, zenith angle, solar azimuth angle and altitude angle. [15]**
6. **Estimate the monthly average daily global and diffuse radiation on a horizontal surface at Vadodara ($22^0$00'N, $73^0$10'E) during the month of March 2019 if the average sunshine hours per day is 9.5. [15]**