

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Voc. (Solar System Technology) (Sem.-1)

SOLAR ENERGY SYSTEM

Subject Code : SST.104

M.Code : 91551

Date of Examination : 21-01-23

Time : 3 Hrs.

Max. Marks : 30

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.**
2. **SECTION-B contains FIVE questions carrying TWO AND A HALF marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying FIVE marks each and students have to attempt any TWO questions.**

SECTION-A

1. Write briefly :

- a) Why is solar energy the best renewable resource?
- b) What is angle of incidence of a solar beam radiation? What is its significance?
- c) What are the main elements of PV systems?
- d) Explain the term solar radiation at the earth surface.
- e) Enumerate the types of batteries for solar PV system.
- f) Define solar constant. What is its standard value?
- g) What are the types of semi-conductor material?
- h) What is the effect of temperature on solar cells?
- i) What are the issues to be considered when selecting an inverter?
- j) What is meant by solar array?

SECTION-B

2. What is the principle of conversion of solar energy into heat? What are solar thermal collectors? What are the characteristic features of a collector system?
3. Define and explain the following angles as related to solar geometry :
 - a) Declination angle
 - b) Inclination angle
 - c) Tilt angle
 - d) Zenith angle.
4. Explain the properties of solar material and design of solar cell with a neat sketch
5. Draw the I-V characteristics of a solar cell and list out the factors affecting the electricity produced by a solar cell.
6. Explain the working of a solar photovoltaic street lighting system with a neat sketch.

SECTION-C

7.
 - a) Draw and explain an equivalent circuit of a practical solar PV cell.
 - b) Explain about the extraterrestrial and terrestrial radiation falling on horizontal surface.
8.
 - a) For a solar PV installation it is necessary to measure the global solar irradiance of the site. Suggest a suitable solar measuring instrument and explain its working.
 - b) Explain briefly about the different parameters that describe the amount of solar energy reaching the earth surface.
9.
 - a) Write short note on: Conversion efficiency and Power output of solar cell.
 - b) Discuss the working and characteristics of Lead-acid batteries used in solar systems and also discuss their maintenance issues.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.