

BACHELOR OF VOCATION
Solar Technology
Subject: Solar Energy Engineering & Technology
Subject Code: OET-601
Semester: Third
January 2021
Theory (External): 70 Marks
Time: 03 Hours

Instructions to the Students

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 2 marks.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 10 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

Roll Number											

SECTION -A (SHORT/OBJECTIVE TYPE QUESTIONS)

(10x2=20 Marks)

- A. In what form solar energy is radiated from the sun?
- a) Ultraviolet Radiation
 - b) Infrared radiation
 - c) Electromagnetic waves
 - d) Transverse waves
- B. Solar radiation which reaches the surface without scattering or absorbed is called as
- a) Beam Radiation
 - b) Infrared radiation
 - c) Ultraviolet radiation
 - d) Diffuse radiation
- C. Insolation is less _____
- a) when the sun is low
 - b) when the sun right above head
 - c) at night
 - d) at sun rise
- D. The angle being measured from a plane and which is equal to angle between the beam of rays and normal to the plane is called _____
- a) Incident angle
 - b) Azimuth angle
 - c) Hour angle
 - d) Declination
- E. Which type of device is used to measure solar irradiance on a planar surface?
- a) Pyranometer
 - b) Net radiometer
 - c) Gardon gauge
 - d) Pyrliometer
- F. Which part of flat plate collectors is coated in black?
- a) Transparent cover
 - b) Absorber plate
 - c) Insulation
 - d) Fins

- G. Which of the following are the types of photovoltaic refrigeration?
- a) Vapour compression refrigeration and thermoelectric refrigeration
 - b) Vapour compression refrigeration and vapour jet refrigeration
 - c) Photovoltaics and concentrated solar power systems
 - d) Rankine cycle and vapour jet refrigeration

H. How does a photovoltaic refrigeration system work?

- a) By converting sun's thermal energy into electricity which is used to drive a motor coupled to a compressor
- b) By converting sun's thermal energy into electricity which is used to drive an AC motor coupled to a compressor of a vapour compression system
- c) By converting sunlight into DC current to drive a DC motor which is coupled to a compressor of a vapour compression system
- d) By converting sunlight into DC current which is used to drive an AC motor coupled to a compressor of a vapour compression system

I. Grid Interconnected systems have the advantage of

- a) Reduced reserve plant capacity, capital cost per kW and economy in operation
- b) Improved load factor, diversity factor and operation efficiency and increased reliability of supply
- c) All of the above
- d) None of the above

J. A solar PV cell is a _____

- a) P-type semiconductor
- b) N-type semiconductor
- c) Intrinsic semiconductor
- d) P-N Junction



SECTION –B (ESSAY TYPE QUESTIONS)
(5x10=50 Marks)

1. What is the effect of distance of earth from sun on the intensity of radiations received? What are the instruments used to measure the intensity of radiations? Also explain relationship between electromagnetic waves and solar radiations.
2. What is working principle of solar photo-voltaic cell? What are the parameters affecting the efficiency of solar cell? Discuss in detail with suitable data.
3. What are the common problems faced in grid stabilization while connecting different types of power plants in a grid? Also discuss remedies to these problems.
4. Explain the construction and working of different types of solar collectors with appropriate diagrams.
5. How solar energy is used for water distillation? Explain construction and working of solar water distillation system in detail along with its limitations.
6. Solar energy is used for different purposes at domestic and commercial scale. Discuss its uses along with suitable examples.
7. What is Snail's law and Bouguer law? What are the uses of these laws in solar engineering? Explain with the help of some suitable examples.
8. Explain the working of solar thermal power generation power system with the help of suitable diagrams. What are its different components? Explain the functioning of main components.

'END OF PAPER'