

BACHELOR OF VOCATION
Solar Technology
Subject: Solar PV Energy Conversion-1
Subject Code: ST-602
Semester: Third
January 2021
Theory (External): 35 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 1 mark.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 5 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)
(10x1=10 Marks)

- A. How does the open circuit voltage of a photo-voltaic device change with intensity of incident light?
- B. Why PV solar cell open circuit voltage drops at high temperature?
- C. What type of electricity (AC or DC) is generated in solar PV cell?
- D. What is conversion efficiency for solar PV cell?
- E. What is module and array?
- F. Explain open-circuit voltage and short-circuit current.
- G. What is electric load matching? How is it achieved?
- H. Why sun tracking of solar PV cell is required?
- I. What are the components of a solar cell?
- J. Why silicon is used in solar panel?

SECTION –B (ESSAY TYPE QUESTIONS)

(5x5=25 Marks)

1. What are different types of PV cell technologies? Explain with the help of neat and clean diagrams. Also compare crystalline and amorphous silicon technologies.
2. What are major factors influencing the electrical design of the solar array? Explain with suitable diagram and data.
3. What is solar radiative flux? How we can calculate solar radiative flux arriving to a solar plate collector placed on the surface of earth? Explain with the help of suitable diagram and mathematical expressions. Also discuss the solar flux variation in India throughout the year.
4. How solar PV power generation system is connected to the grid? What are the types of grid connected PV system? What are the connection issues faced when solar PV plant is connected to grid? What are the advantages of using grid connected solar PV system?
5. What are the major advantages and disadvantages of solar photovoltaic system? Discuss with suitable diagram and data.
6. Explain construction and working of solar cell with the help of suitable diagrams. Also compare series combination, parallel combination and series-parallel combination of solar cell.
7. What are the different types of materials used in the construction of different PV cells? Explain their design and operational details with suitable data and diagrams.
8. What is energy payback period? How it is calculated? Discuss with some suitable example concentrated on solar power plant.

‘END OF PAPER’