BACHELOR OF VOCATION

Solar Technology

Subject: Solar Thermal Energy Conversion-1

Subject Code: ST-604

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. What are the major advantages of concentrating solar power (CSP) technology?

B. What are the three major types of solar energy concentrators?

C. What is synchronous generator?

D. What is optical transition in bulk semiconductors?

E. What is collector efficiency factor?

F. What is thermo-siphon?

G. What is P-N junction?

H. What are radiation characteristics of opaque materials?

I. What is the purpose of the vacuum in evacuated tubes?

J. How long is a solar hour?

SECTION –B (ESSAY TYPE QUESTIONS)
(5x5=25 Marks)

1. Explain construction and working of the solar thermal power plant system used for generating electricity with the help of schematic diagrams.

2. What are the two important types of instruments used to measure solar radiation? Explain their working with the help of suitable diagram and data.

3. What are the different types of technologies used to store thermal energy? What is the benefit of using solar thermal energy storage technology along with the solar power plant technology? Discuss economic aspects also for this hybrid technology.

4. What are the major factors or parameters responsible for deteriorating the performance of liquid flat plate collector? Also compare the performance of liquid flat plate collector with conventional collector.

5. Explain the construction and working of the Schottky junction solar cell with the help of diagrams? Schottky junction solar cells can be constructed using many different material types. What are these different materials? Compare their characteristics.

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 is the difference between conduction and convection? Discuss in detail. How three modes of heat transfer (conduction, convection and radiation) are used in solar collector to heat up the working fluid?

8. What is the difference between solar collector with porous and non-porous absorber? Discuss in detail.

'END OF PAPER'