B.Tech. (Electrical Engineering), 8th Semester (G-Scheme), Examination, December-2022

SOLAR THERMAL APPLICATIONS

Paper -OEC-EE-402-G/OEC-EE-406-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: *Attempt **five** questions in all. **Question no.1 is compulsory** and Attempt **one** question from each section. All question carry equal marks.*

1. (a) Differentiate between Terrestrial and extra-terrestrial regions with a neat sketch. 2.5

(b) Define diffuse, global and incident radiations with diagrams. 2.5

(c) Define transmissivity. Which instrument is used to find the transmissivity of a surface? 2.5

(d) Explain CPC 2.5

(e) Define PCM 2.5

(f) Define drying phenomenon. 2.5

Section-A

2. Explain the concepts of conduction, convection and radiation with suitable examples and diagrams. 15

3. What is a pyranometer? For what purpose it is being used. Explain its working principle with a suitable diagram. 15

Section-B

4. What is a Collector? Explain the liquid flat-plate collector with a neat diagram. 15

5. Differentiate between Cylindrical parabolic collector and compound parabolic collector with neat diagrams. 15

Section-C

6. What are thermal energy storage materials? Classify them with suitable examples and explain their properties. 15

7. Explain the thermal chemical storage system with a schematic diagram. 15

Section-D

8. Define the process of drying? Explain the open sun drying mechanism with a diagram. 15

9. Explain solar air heater and its working with diagram. 15

B.Tech. (Electrical Engineering) 8th Semester (G-Scheme) Examination, July–2022

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Time allowed : 3 hours] *[Maximum marks : 75*

Note : *Attempt **five** questions in all, selecting **one question** from each unit. **Question Number 1 is compulsory**. All questions carry equal marks.*

1. (a) What is the indirect form of solar energy? 2.5×6

(b) Define angle of incidence, surface azimuth angle.

(c) Write advantage and disadvantage of concentrating collector.

(d) Under what circumstances storage of energy become essential?

(e) What is purpose of double layer of glazing in green house?

(f) Define concentration ratio and collector efficiency.

Unit-I

2. Explain in detail various instruments used for measurement of solar radiation 15

3. Derive empirical equations for estimating availability of solar radiation 15

Unit-II

4. With the help of schematic diagram explain working of cylindrical parabolic collector and compound parabolic collector 15

5. Explain the effect of various parameters on the performance of solar collector. 15

Unit-III

6. Describe Sensible heat storage technique in thermal energy storage system. 15

7. On what basis energy storage systems are classified? Can energy stored in one form be stored in other form? 15

Unit-IV

8. Write short notes on

   (a) Performance of conventional air heater 7.5

   (b) Air dryer 7.5

9. What do you understand by greenhouse effect? What are its consequences? How is it caused? 15