

M.E. Second Semester (Mechanical Engineering (Thermal Engineering)) (New-CGS)
13523 : Elective-II : Solar Energy : 2 MTE 5

P. Pages : 2

Time : Three Hours



AW - 3815

Max. Marks : 80

- Notes :
1. Answer **three** question from Section A and **three** question from Section B.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answer necessary with the help of neat sketches.

SECTION - A

1. a) What kind of solar radiation falling on earth surface? Also Explain nature of reflection from ideal, specular, diffuse & real surface with neat sketch. 7
b) What are properties that a reflecting surface should posses? List the different materials with their properties that can be used as an effective reflector. 7
2. a) Discuss the various parameters inside & outside of the green house which influence the crop yield & thermal environment? 7
b) What are the requirements of a winter green house? Explain with schematic diagram a typical winter green house. 6
3. a) Explain the following terms with reference to solar cells: 6
i) Solar P.V. array
ii) Energy payback period
iii) Shadowing of a cell in a module.
b) Explain the working principle of solar cell. Describe a basic photovoltaic system for power generation. 7
4. a) Explain hot air industrial process heat system with neat sketch. 6
b) With the help of schematic diagram, explain solar process steam system for industrial process heat. 7
5. a) Explain the Working of solar pond with neat sketch. 7
b) Explain the working of Box type solar cooker with neat sketch. 6

SECTION - B

6. a) What are the advantages of a tabular collector? 4
b) Explain the term collector efficiency factor. 3
c) Explain the F-chart method to determine solar load fraction. 7

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| 7. | a) | Discuss the important parameters used for deciding the size of solar heating system for a building? | 7 |
| | b) | Compare the relative merits & demerits of Li-Br water & Aqua ammonia vapour absorption cooling system. | 6 |
| 8. | a) | Discuss the methods of improving the efficiency of flat plate collector. | 6 |
| | b) | Derive an expression for temperature distribution across the absorber plate of LFPC. | 7 |
| 9. | a) | Explain different types of concentrating collector with it's advantages & disadvantages. | 7 |
| | b) | What are tracking requirements? Explain different tracking methods used for orientation of a collector. | 6 |
| 10. | a) | Explain the use of solar Furnace. State it's advantages & disadvantages. | 6 |
| | b) | Discuss the parameters which affecting the performance of concentrating collector. | 7 |
