

GOVERNMENT DEGREE COLLEGE - NANDIKOTKUR

DEPARTMENT OF PHYSICS

III Year B.Sc.PHYSICS :V SEMESTER

Academic Year 2024-25

Course 7B: *SOLAR ENERGY &APPLICATIONS*

QUESTION BANK

Name of the Lecturer: Dr. Talat Parveen

UNIT I: Basic Concepts of Solar Energy

Long Answer Questions

1. Describe the spectral distribution of Solar radiation.
2. Explain how direct radiations are measured with Pyrheliometer.
3. Describe how diffuse radiations is measured by pyranometer.

Short Answer Questions

1. Define Solar constant
2. Define air mass and Zenith angle and write relation between them.
3. Write short notes on Direct, diffuse radiations
4. What is standard time and local apparent time?
5. Give distinction between Pyranometer and Pyrheliometer.

UNIT II: Solar Thermal Collectors

Long Answer Questions

1. Explain in detail the types of Solar thermal collectors
2. Explain the construction and working of Flat plate collector
3. Give the energy balance equation for flat plate collector and write efficiency equation
4. Write the working of Evacuated Tube collector
5. Explain the working of Natural and forced circulation solar water heating systems
6. Explain the working of any two types of concentrating collectors.

Short Answer Questions

1. Define the collector efficiency factor, collector heat-removal factor and collector flow factor
2. Write the working of box type solar cooler
3. Explain the working of solar dryers
4. Explain the working of solar desalinators

UNIT III: Fundamentals of solar cells

Long Answer Questions

1. Explain the types of interfaces homo, hetero, Schottky interfaces and write their advantages.
2. Describe working of solar photovoltaic cell
3. Draw the equivalent circuit of solar photovoltaic cell and write the output parameters
4. Draw the V-I characteristics of Solar cells in series and parallel

Short Answer Questions

1. What are conversion efficiency and quantum efficiency?
2. What are the effects of light intensity, inclination and temperature on efficiency

UNIT IV: Types of Solar Cells and Modules

Long Answer Questions

1. Explain the Types of solar cells
2. Explain working of crystalline silicon solar cells
3. Explain poly-Si cells
4. Explain amorphous solar cells
5. Write the steps involved in fabrication of a module

Short Answer Questions

1. Explain the construction of CdTe/CdS type of thin-film solar cells
2. Explain construction of CuInGaSe₂/CdS and their advantages
3. Explain working of Multijunction solar cells
4. Write briefly about solar modules in series and in parallel
5. What are the functions of Bypass and Blocking diodes

UNIT V: Solar Photovoltaic Systems

Long Answer Questions

1. Write about the energy storage modes.
2. Explain the electrochemical storage.

3. Explain the construction of solid- state battery
- 4.Explain the working of Molten solvent battery
- 5.Write the functioning of lead acid batteries
- 6.Write about supercapacitors

Short Answer Questions

- 1.What are primary and secondary batteries
2. Explain fly wheel storage
- 3.Explain about electrical storage
