

SCIM GOVERNMENT COLLEGE TANUKU W.G.Dt

DEPARTMENT OF PHYSICS

QUESTION BANK FOR PAPER-VI (B)

LOW TEMPERATURE PHYSICS & REFRIGERATION

UNIT-I PRODUCTION OF LOW TEMPERATURE

What is the principle of regenerative cooling. State and explain Joule-Thomson effect? 10M

How to produce low temperatures by adiabatic demagnetization method? 10M

Write a short note on liquefaction of air?

Write a short note on liquefaction of hydrogen?

Write a short note on liquefaction of nitrogen?

What are the different methods of liquefaction of gases?

What are the properties of materials at low temperatures?

Write a short note on superconductivity?

UNIT-II MEASUREMENT OF LOW TEMPERATURE

Explain the construction and working of gas thermometer? 10M

Explain the construction and working of resistance thermometer? 10M

Explain the construction and working of vapour pressure thermometer? 10M

Explain the construction and working of magnetic thermometer? 10M

What are the advantages and disadvantages of gas thermometer?

What are the advantages and disadvantages of resistance thermometer?

What are the advantages and disadvantages of vapour pressure thermometer?

What are the advantages and disadvantages of magnetic thermometer?

Write a short note on thermocouple?

UNIT-III PRINCIPLES OF REFRIGERATION

Explain the construction and working of vapour compression refrigeration system? 10M

Explain the construction and working of vapour absorption refrigeration system? 10M

What is refrigeration and explain the refrigeration cycle with block diagram? 10M

What is refrigerant? Explain the classification of refrigerants and explain eco-friendly refrigerants? 10M

What are the different stages and types of refrigeration?

What are the properties of refrigerant?

Write a short note on ideal refrigerant?

What are the differences between natural and artificial refrigeration?

UNIT-IV COMPONENTS OF REFRIGERATOR

Explain the construction/block diagram and working of refrigerator and also explain its coefficient of performance? 10M

Explain the different components of refrigerators? 10M

Write a short note on energy efficiency ratio of refrigerator?

How to find refrigerant leakage and detection in refrigerator?

What is the block diagram of refrigerator?

UNIT-V APPLICATIONS OF LOW TEMPERATURE & REFRIGERATION

Explain in detail the different applications of low temperatures? 10M

Describe the Cryogenic rocket propulsion system? 10M

Explain in detail the different applications of refrigeration? 10M

What are the applications of liquid nitrogen and liquid hydrogen in medical field?

What are the applications of superconducting magnets in MRI?

Write a short note on tissue ablation (cryosurgery)?

Write a short note on desalination of water?

Write a short note on data centres?

What are the different methods for food preservation?

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DEPARTMENT OF PHYSICS

QUESTION BANK FOR PAPER-VII (B)

SOLAR ENERGY AND APPLICATIONS

UNIT-I BASIC CONCEPTS OF SOLAR NERGY

Define solar constant and how to determine it by Angstrom Pyrheliometer experimentally?
(Direct radiation measurement)

Explain the construction and working principle of pyrometer?

(diffuse radiation measurement)

Explain the spectral distribution of solar radiation?

What are the differences between Pyrheliometer and Pyrometer?

Write a short note on solar constant?

Write a short note on air-mass?

Write a short note on zenith angle?

Write a short note on equation of time?

Write a short note on apparent and standard time?

UNIT-II SOLAR THERMAL COLLECTORS

Explain the construction and working of flat plate solar thermal collector?

Explain the construction and working of evacuated tube solar thermal collector?

Explain the construction and working of solar water heating systems?

Explain the construction and working of solar cooker?

Explain the construction and working of concentrating collectors?

Write a short note on solar dryers?

Write a short note on solar desalinators?

Briefly explain the energy balance equation and efficiency?

Write a short note on heat removal factor and collector flow factor?

UNIT-III FUNDAMENTALS OF SOLAR CELLS

Explain the different types of semiconductor interfaces?

What is photovoltaic cell and explain the measurement of I-V characteristics of photovoltaic cell?

Explain the effect of light intensity on photo voltaic cell?

Write a short note on Scotty barrier?

Explain the series and shunt resistance?

Write a short note on homo junction and hetero junction?

UNIT-IV TYPES OF SOLAR CELLS AND MODULES

Explain the structure of crystalline silicon solar cells?

Explain the structure of thin film solar cells?

What are module fabrication steps? Explain the fabrication of modules in series and parallel?

What are multi junction cells-explain?

What are blocking diodes-explain

What are the advantages and limitations of thin film solar cells?

UNIT-V SOLAR PHOTOVOLTAIC SYSTEMS

What are energy storage modes in PV systems and explain the electrochemical energy storage system?

What are molten solvent batteries and explain lead acid battery?

Explain the mechanical energy storage in fly wheel?

What are primary and secondary batteries?

Write a short note on super capacitors?

Write a short note on dry batteries?