

B.Sc. Sem IV Important Questions in Heat Transfer Mechanism for Examination (based on previous year papers and latest Syllabus)

Short Answer Type Questions :-

1. Write short notes on the following : i) Lattice vibration ii) Wien's displacement law
2. What do you understand by black body radiation ? Also discuss Kirchoff's law.
3. On the basis of Kirchoff's law of radiation explain how good absorbers of radiation are also good emitters.
4. Show that Planck's radiation law reduces to Rayleigh Jean's law for longer wavelengths.
5. Show that Planck's radiation law reduces to Wein's Law for shorter wavelengths.
6. Describe the method of cooling by Adiabatic demagnetisation.
7. What is meant by temperature of inversion ? Explain.
8. What are the conditions for producing more cooling by adiabatic demagnetisation of a paramagnetic salt.
9. "The melting point of ice decreases with increase in pressure". Explain this statement thermodynamically.
10. What is a perfect Black body ?
11. Under what condition does a gas exhibit cooling or heating effect to Joule - Kelvin expansion.
12. Write a short note on Joule Thomson coefficient.

Long Answer Type Questions :-

1. Derive Planck's formula for Black body radiation.
2. State and prove Stefan Boltzmann law.
3. Write short note on following :- a) Average Energy of Planck's oscillator b) Kirchoff's law
4. Deduce Joule-Kelvin coefficient for vanderwall (real) gas.
5. What are liquid Helium I and II ? Write the properties of liquid Helium II.
6. Explain the following : a) Emissive power, absorptive power and Prevost's law of exchanges. b) Radiation inside an isothermal enclosure are isotropic.
7. Describe the necessary theory for method of producing low temperature by adiabatic demagnetisation of paramagnetic salt.

Some Important Topics :-

1. **Fourier's law in Conduction**
2. **Newton's law of Cooling**
3. **Dimensionless numbers and their Physical significance**
4. **Law of Equipartition of Energy**
5. **Most probable, average and rms velocity**

6. Kinetic interpretation of temperature
7. Radiation from non-black bodies
8. Black body spectrum formula
9. Air conditioning mechanism
10. Hampson's and Linde's regenerative cooling machine
11. Solidification of Helium

– The End –

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