LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PHYSICS**

THIRD SEMESTER – APRIL 2017

PH 3505 / PH 3503 - THERMODYNAMICS

Date: 03-05-2017 Dept. No. Max. : 100 Marks
09:00-12:00

PART A (10X 2 = 20)
Answer ALL questions

1. What is transport phenomenon in a gas?
2. At what temperature the rms velocity of oxygen molecules becomes twice their rms velocity at 27°C?
3. What is the principle of regenerative cooling?
4. What is super fluidity?
5. Define the concept of entropy..
6. Give the important features of first law of thermodynamics.
7. Define Gibbs and Helmholtz functions.
8. What is Joule –Kelvin effect?
9. Define solar constant.
10. What is thermodynamic probability ?.

PART B (4 x7. 5 = 30)
Answer any FOUR questions.

11. Obtain an expression for Coefficient of thermal conductivity of gases on the basis of transport phenomenon..
12. Describe Linde's experiment of liquefying air.
13. Derive Clausius -Claperon latent heat equation.
14. Obtain expressions for change of entropy in reversible and irreversible processes.
15. Applying Maxwell-Boltzmann distribution law show that the internal energy of an ideal monoatomic gas depends on its temperature..

PART C 4 x 12.5 = 50)
Answer any FOUR questions

16. Obtain expressions for Coefficient of viscosity of gases and coefficient of diffusion on the basis of transport phenomenon.
17. Describe Andrews' experiment on carbon dioxide. Explain the isothermals produced in the experiment. Discuss the results.
18. State and explain Classius theorem and hence deduce an expression for Classius inequality.
19. Derive Maxwell's thermodynamic relations..
20. Establish Bose –Einstein distribution law. Using it, derive Planck's law for black body radiations.

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