Degree (Part-1) Examination 2021

(Session 2020-22)

B.Sc. (Honours)

PHYSICS

Time : Three Hours] *[Maximum Marks : 75*

Note: Candidates are required to give their answers in their own words as far as practicable. Answer five questions selecting one from each group in which question (1) is compulsory.

1. Select the correct answer of the following:

(a) The average energy of the molecules of monoatomic gas at a temperature T is:-

(i) Einstein

(ii) Carnot

(iii) Brown

(iv) Maxwell

(g) "Good absorbers are good emitters"- The statement is called -

(i) Kirchhoff's law

(ii) Wien's law

(iii) Stefan's law

(iv) Prevost's Theory

(h) According to Wein's law:-

(i) $\lambda_m T$ = Constant

(ii) $\frac{\lambda_m}{T}$ = Constant

(iii) $\frac{T}{\lambda_m}$ = Constant

(iv) $\lambda_m{}^2 T$ = Constant

(i) Viscosity of a gas is directly proportional to:

(i) Temperature (T)

(ii) Square root of Temperature ($\sqrt{T}$)

(iii) Square of Temperature (T^2)

(iv) Density of gas

(j) Black body emits:-

(i) Line spectrum

(ii) Band spectrum

(iii) Continuous spectrum

(iv) Mixed spectrum

(k) If the density of a material is P and specific heat is C, Then its thermal diffusivity (h) is:-

(i) $h = \frac{c}{Pk}$

(ii) $h = \frac{k}{Pc}$

(iii) $h = \frac{kP}{c}$

(iv) $h = \frac{Pc}{k}$

(l) Entropy is maximum is which case:-

(i) Solid

(ii) Liquid

(iii) Gas

(iv) Can be any

(m) The total heat of a substance is known as:-

(i) Enthalpy

(ii) Entropy

(iii) Internal energy

(iv) Thermal Conductivity

(n) Net entropy change of a system in car not's engine:-

(i) Zero

(ii) More than 1

(iii) Positive

(iv) Negative

(o) Thermal Conductivity of bad Conductors is measured by:-

(i) Searle's method

(ii) Lee's disc method

(iii) Callender and Barne's method

(iv) None of these

Group-A

2. Derive maxwell's law of distribution of velocity and its experimental verification.

3. Derive general equation for one dimensonal flow of heat in a long bar. obtain its steady state solution.

4. Define mean path of gas molecules and describe

experimental determination.

5. What are transport phenomena in goses? Derive expression for coefficient of viscosity of a perfect gas on the basis of kinetic theory.

Group-B

6. State and prove carnot's. Theorem

7. Discuss the concept of absolute scale of temperature and explain how this scale can be realise in practice.

8. Derive marwell's four thermodynamical relations and show that for perfect gas C_P-C_V=R

9. State and establish kirchhoff's law of black body radiation. How is it experimentally verified.

10. Describe the different methods for production and measurment of low temperature.

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