

Degree (Part-1) Examination 2021

(Session 2020-23)

B.Sc. (Subsidairy)

PHYSICS

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

Note: Answer five questions, Selecting at least one from each group, in which Q. No. 1 is compulsory.

Q.1 Choose correct answer of the following :-

(a) The rest mass of a photon is :-

(i) 0 (ii) 1u

(iii) 10^{-24}Kg (iv) 10^{-31}Kg

(b) The gravitatonal field intensity at a point inside of spherical shell is :

(i) zero (ii) Infinity

(iii) same as outside (iv) None of these

(c) The value of poisson ratio (σ) in elasticity is

(i) From 0 to + $\frac{1}{2}$ (ii) < -1

P.T.O.

(iii) from -1 to + $\frac{1}{2}$ (iv) None of these

(d) Surface tension of liquid with rise of temperature

(i) Increases (ii) decreases

(iii) Remains Constant (iv) First increase then decrease

(e) The correct relation is :

(i) $\gamma > \eta$ (ii) $\sigma < -1$

(iii) $\sigma = \frac{\gamma}{2n} - 1$ (iv) $\sigma = \frac{3k}{\gamma}$

(f) Central force is an example of :

(i) Conservative force (ii) None Conservative force

(iii) Frictional force (iv) fictrtious force

(g) When a rod is bent, The bendling moment produced in it is :

(i) $\frac{9R}{Y}$ (ii) Y9R

(iii) $\frac{Y9}{R}$ (iv) $\frac{YR}{9}$

(h) For perfectly white body absorption power is :-

(i) 0 (ii) 0.5

(iii) 1 (iv) α

(i) The molecule of an ideal gas have :-

(i) only K.E. (ii) only P. E.

(iii) Both K. E. and P. E. (iv) non of these

(j) The total heat of substance is known as :

(i) Internal energy (ii) Enthalpy

(iii) Entropy (iv) Thermal conductivity

(k) Wien's displacement law is a special cases of :-

(i) Newton's law of cooling (ii) Stefan's law

(iii) plank's law (iv) Kirchoff's law

(l) Which of following represents the equation of progessive wave :-

(i) $y = aSin(kx + \omega t)$ (ii) $Y = aSin(kx - \omega t)$

(iii) $y = a\,Cos\,(kx + \omega t)$ (iv) $y = aSinkx.Cos\omega t$

(m) The velocity of sound (v) related with absolute temperature at Constant pressure will be :-

(i) $\frac{v}{JT}$ = Constant (ii) $\frac{v}{T}$ = Constant

(iii) $\frac{v}{T^2}$ = Constant (iv) $\frac{v}{T^4}$ = Constant

(n) The mean free path of a gas varies with pressure (P) as :

(i) P (ii) P^{-1}

(iii) P^{-2} (iv) P^2

(o) The ratio of two specific heats (c_p and c_r) of a diatomic gas is :-

(i) 1.33 (ii) 1.40

(iii) 1.60 (iv) 1.66

Group-A

2. Establish mass-energy equivalence relation and discuss some of consequences.

3. Define various elastic Constants and establish ralation between them.

4. Describe, with theory, Poiseuille's method for the determination of co-efficient of viscosity of liquid.

5. State and explain d' Alembert's principle. using this principle, derive Lagrange's equation of motion for a holonomic system.

Group-B

6. State and explain Fourier's Theorem. Apply the Theorem for analysis of rectangular wave.

7. What is stationary waves? Discuss formation of stationary waves. Give some suitable example.

Group-C

8. Define mean free path of gas molecules. Describe an experiment for determination of mean free path of gas molecules.

9. Define absolute scale of temperature and explain how it is realized in practice.

10. State and establish Kirchoff's law of black-body radiation. Give some important application of this law.

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