

Degree (Part-1) Examination 2021

(Session 2020-23)

B.Sc. (Honours)

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) As an object moves with the speed of light, its mass becomes :-

(i) Zero (ii) Double

(iii) Remains constant (iv) Infinite

(b) How much shift was expected in Michelson Morley experiment?

(i) 0.01 (ii) 0.02

(iii) 0.03 (iv) 0.04

(c) For Einstein's Relation $E^2 - p^2 c^2 =$ .....

(i) m_0c^2 (ii) $m_0^2c^4$

(iii) m_0c^4 (iv) $m_0^2c^6$

P.T.O.

(d) Classical mechanics describes the motion of :-

(i) Microscopic object (ii) Macroscopic object
(iii) Both (1) and (ii) (iv) None of these

(e) Abstract methods were developed leading the reformations of classical mechanics :-

(i) Lagrangian-Mechanics (ii) Hamltonian mechanics
(iii) Quantum-mechanics (iv) Both (1) and (ii)

(f) In Lagrang's equation virtual displacement does not involved :-

(i) Space (ii) Time

(iii) Both (1) and (ii) (iv) None of these

(g) How many ways are used to find the motion of a particle in a central force field.

(i) One (ii) Two

(iii) Three (iv) Four

(h) Theortical value of Poisson's ratio lies between :-

(i) -1 to 0.5 (ii) -1 to -2

(iii) 0.5 to 1 (iv) None of these

(i) The correct relation between y, η and k in elasticity is :-

(i) $\frac{y}{3} = \frac{3}{k} + \frac{1}{\eta}$ (ii) $\frac{9}{y} = \frac{\eta}{3} + \frac{1}{k}$

(iii) $\frac{3}{y} = \frac{1}{\eta} + \frac{1}{3k}$ (iv) $\frac{y}{3} = \frac{3}{\eta} + \frac{1}{k}$

(j) At the boiling point of water, its surface tension is :-

(i) Infinite (ii) zero

(iii) is the same as that at room temperature (iv) is maximum

(k) Sound travels through a gas under which condition :-

(i) Isothermal condition (ii) Adiabatic condition

(iii) Transverse condition (iv) Non-isothermal condition

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

(i) $y = a\sin(kx + wt)$ (ii) $Y = a\sin(kx - wt)$

(iii) $y = a\cos(kx + wt)$ (iv) $y = a\sin kx.\cos wt$

(m) What of following waves can be transmitted through solids, liquids and gases.

(i) Transverse waves (ii) Longitudinal waves

(iii) Mechanical waves (iv) Electromagnetic waves

(n) What property measures the resistance of a liquid to flow :-

(i) Density (ii) Viscosity

(iii) Volume (iv) Solubilit

(o) Central force is an example of :-

(i) Conservative force (ii) Non conservative force

(iii) Fictitius force (iv) frictional force

Group-A

2. Describe with necessary theory of the Michelson Morley experiment and explain the physical significance of the result.

3. Describe an expression for the variation of mass with velocity for a relativistic particle.

Group-B

4. Deduce Lagrange's equation of motion for dynamical system using D' Alembert's principle.

5. Derive Kepler's Law of planetary motion from motion under a central force.

6. Define various elastic Constant. Establish relation between them.

7. What are ripples and gravity waves? How the surface tension determined by the method of ripples.

8. Obtain Euler's equation for perfect fluid.

Group-C

9. State Fourier theorem. Derive expression for its co-efficients. Apply this theorem to rectangular wave form.

10. Define intensity and Loudness of sound. Describe an experiment to measures the intensity of sound.

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