



PHYSICS THEORY CLASS XI

TOTAL: 85 MARKS

TOTAL TIME: 2 HOURS

SECTION A (42 MARKS)

THIS SECTION CONSISTS OF 42 MULTIPLE CHOICE QUESTIONS. EACH QUESTION CARRY ONE MARK.

01. Choose the correct answer from the given options:

- i) The dimension of angular momentum:
a) ML^2T^{-1} b) ML^2T c) MLT^{-1} d) MLT^{-2}
- ii) The number of significant figure in 2.500×10^3 is:
a) 2 b) 3 c) 4 d) 7
- iii) $\hat{k} \cdot (\hat{i} \times \hat{j})$ is equal to:
a) Zero b) 0 c) j d) -k
- iv) The vector in space has:
a) One component b) Three components c) Two components d) None
- v) If $\vec{A} = 5\hat{i} + \hat{j}$ and $\vec{B} = 2\hat{k}$ then $\vec{A} - \vec{B}$ is equal to:
a) $5\hat{i} + \hat{j} + 2\hat{k}$ b) $5\hat{i} - \hat{j} - 2\hat{k}$ c) $5\hat{i} + \hat{j} - 2\hat{k}$ d) $5i - j - 4k$
- vi) When a bullet is fired the gun move back
a) To maintain the force b) To enhance the velocity of bullet
c) To keep the momentum conserves d) None of these
- vii) A force which resists the motion of a body is called:
a) Friction b) State friction
c) Kinetic friction d) All of these



xxi) Interferometers measures:

- (a) Wavelength of light (b) Thickness of thin objects
(c) Illuminating power of light (d) Velocity of light in gases

xxii) To replace a bright fringe by the next bright fringe in a Michelson interferometer, the movable mirror is moved through a distance equal to:

- (a) λ (b) $\lambda/2$ (c) $\lambda/4$ (d) 2λ

xxiii) In Young's double slit arrangement, the bright fringes obtained are of:

- (a) Uniform intensity (b) Non uniform width (c) Colored (d) Circular

xxiv) In Young's double slit experiment, the fringe spacing is:

- (a) $\frac{d\lambda}{L}$ (b) $\frac{\lambda L}{d}$ (c) $\frac{d}{\lambda L}$ (d) $L\lambda$

xxv) Two convex lenses, of the same focal length f , are kept touching each other. The focal length of the combination will be:

- a) f b) $f/2$ c) $2f$ d) $2f + 2$

xxvi) If the focal length of the lens is 10cm then its power in Diopter is

- a) 9 b) 5 c) 10 d) 12

xxvii) In compound microscope the objective will form a image which is

- a) Virtual and magnified b) Real and diminished
c) Real and magnified d) virtual and diminished

xxviii) An astronomical telescope has the magnifying power 100 and focal length of eye piece is 4cm, then the focal length of the objective is

- a) 40 cm b) 400 cm c) 25 cm d) 14cm

xxix) An astronomical telescope is focused at infinity. The focal length of its objective is 0.2m and that of the eyepiece is 5cm. the length of the telescope is :

- a) 2.5cm b) 4cm c) 5.2cm d) 25cm

xxx) If the mass of the earth becomes four times to its initial value then the value of 'g' will be:

- a) Equal to its initial value b) Four times to its initial value
c) One fourth of its initial value



SECTION B (SHORT ANSWER QUESTIONS) (24 MARKS)

Attempt any three questions from this section. Each question carries two parts and each part carries four marks

02. a) Establish work energy equation.
- b) Calculate centripetal acceleration and centripetal force on a man whose mass is 80 kg who is resting on the ground at the Equator, given that the radius of earth is 6.4×10^6 m
03. a) Define Position vector, Free vector, equal vector, negative vector and null vector
- b) A 100 grams bullet is fired from a 10 kg gun with a speed of 1000 m/s. What is the speed of recoil of the gun?
04. a) Define equilibrium give condition of equilibrium
- b) The planet Jupiter of mass 2×10^{27} kg revolves round the sun of mass 2×10^{30} kg in a circular orbit of radius 7.8×10^{11} m; calculate the gravitational force between them and the orbit speed of Jupiter
05. a) Briefly describe the defect of lenses?
- b) A note of frequency 500 Hz is being emitted by an ambulance moving towards a listener at rest. If the listener detects a frequency of 526 Hz, calculate the speed of the ambulance. Take the speed of sound at room temperature to be 340 m/s.
06. a) Explain the interconversion of K.E and P.E?
- b) Two parallel slits are illuminated the light of two wavelengths one of which is 6×10^{-7} m. On a screen the fourth dark line of the known wavelength coincides with the fifth bright line of the unknown wavelength. Calculate the unknown wavelength.

OR

An astronomical telescope has a length of 105 cm, and its magnification is 6. Determine the power of objective and eye piece.



SECTION C (DESCRIPTIVE - ANSWER QUESTIONS) (19 MARKS)

Attempt any 1 questions from this section. Each question carries 19 marks

07-a) Prove that motion of a simple pendulum is simple harmonic motion. When the angle of its swing is very small

07-b) What is Diffraction of light? Define Diffraction grating and grating element. How can it be used to determine the wave length of monochromatic light? Derive the mathematical expression.

07-c) Obtain the thin lens formula for the convex lens?

08-a) Derive the relation for variation in g with depth

08-b) Derive an expression for tension in the string and the acceleration of the system when two bodies move vertically?

08-c) Define scalar and vector product. Give example and property of each.