PHYSICS (Model Paper)

Class XI

Total no. of questions: 30

Max. Marks: 70

Long answer type (5 x 4)

Q1 Derive the expression for the, Path or trajectory, time of flight and horizontal range when a body is projected from a certain height in the direction of horizontal.

Or

What is centripetal acceleration, derive an expression for it.

Q2 Discuss the laws of friction, derive the expression for co-efficient of friction in terms of angle of repose.

Or

What is angle of banking, derive the expression for angle of banking on a curved road with certain co efficient of friction

Q3 Discuss and Derive Bernauli's Equation?

Or

What are the modes of heat transfer, Discuss Conduction, Convection and Radiation?

Q4 Discuss SHM as a special case of circular motion and derive expression for displacement, velocity and acceleration of a body executing S.H.M

Or

Derive the expression for the frequency and time period of a body executing oscillations in case of a stretched string.

Short answer type (3 x 8)

Q5: Find the derivative of $\log x$ by ab-initio method

Q6 If the time period of simple pendulum depends on: Length of thread, acceleration due to gravity, mass and angle .Derive the expression for time period and frequency using dimensional analysis.

Q7 What is kinetic energy work theorem, derive it.

Q8 What are the theorems of parallel and perpendicular axis in case of rigid body rotational motion (statements only)

Q9 Prove that the steel is more elastic than rubber.

Q10 Define the terms phase epoch and phase difference.

Q11 Derive the expression for change in the value of 'g' (acceleration due to gravity) due to change in height.

Q12 What is kinetic interpretation of temperature? Derive relation between kinetic energy and temperature.

Very short answer type (2 x 8)

Q13 Define par-sec and light year

Q14 Derive $v = u + at$ using calculus method.

Q15 What is kinetic energy momentum theorem

Q16 Define the term radius of gyration of a rigid body.

Q17 What is Keplers 2nd law.

Q18 What is specific heat, write its units.

Q19 What is the 1st law of thermodynamics (discuss sign convention also)

Q20 Write down the assumptions of kinetic theory of gases, any four.

Objective type questions (1 x 10)

Q21 Tangent at a point on a curve gives:

a) Integral

b) Derivative

c) Increment

d) Limit

Q22 Centripetal acceleration changes

a) Magnitude of velocity

c) Both

b) Direction only

d) None

Q23 Force of friction depends on:

a) Area in contact

c) Both

b) Normal reaction only

d) None

Q24 Momentum is related to kinetic energy as

a) $\sqrt{2m\ K.E}$

b) 2m K.E

c) ½ mv^2

d) ½ m K.E

Q25 Axial vector is :

a) Force

b) Position vector

c) Momentum

d) Angular momentum

Q26 The weakest force in nature is:

a) Weak force

b) Gravitational force

c) Nuclear force

d) Electromagnetic force

Q27 C_p (specific heat at constant pressure) is:

a) Greater than C_v

b) Less than C_v

c) Equal to C_v

d) None

Q28 Kinetic energy per molecule of gas is:

a) $\frac{3}{2}RT$

b) $\frac{3}{2}KT$

c) $\frac{1}{2}KT$

d) $\frac{1}{2}RT$

Q29 Units of wavelength are:

a) Radian

b) Sec^{-1}

c) Hertz

d) Meter

Q30 Harmonic functions are:

a) X^2

b) E^x

c) Sin x

d) Log x