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) Integralb) Derivative
- c) Increment d) Limit
- **Q22** Centripetal acceleration changes

a)	Magnitude of velocity	b)	Direction only	
c)	Both	d)	None	
Q23	Force of friction depends on:			
a)	Area in contact	b)	Normal reaction only	
c)	Both	d)	None	
Q24	Momentum is related to kinetic energy as	5		
a)	$\sqrt{2m\ K.E}$	b)	2m K.E	
c)	½ mv²	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	9
Q27	$C_{\text{\scriptsize p}}$ (specific heat at constant pressure) is:			
a)	Greater than C_{ν}	b)	Less than C _v	
c)	Equal to C_{ν}	d)	None	
Q28	Kinetic energy per molecule of gas is:			
a)	$\frac{3}{2}RT$	b)		$\frac{3}{2}KT$
c)		d)		
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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	