

DESIGN OF THE QUESTION PAPER**PHYSICS - CLASS XI**

Time : 3 hours

Maximum Marks : 70

The weightage of the distribution of marks over different dimensions of the question paper shall be as follows

A. Weightage to content/subject units

<u>Unit</u>	<u>Marks</u>
Physical World & Measurement	03
Kinematics	10
Laws of Motion	10
Work, Energy & Power	06
Motion of System of particles & Rigid Body	06
Gravitation	05

Properties of Bulk Matter	10
Thermodynamics	05
Behaviour of Perfect Gas & Kinetic Theory of gases	05
Oscillations & Waves	10
Total	70

B. Weightage to form of questions

S. No	Form of Questions	Marks for each Question	No of Questions	Total Marks
1	Long Answer Type (LA)	5	3	15
2	Short Answer SA(I)	3	9	27
3	Short Answer SA(II)	2	10	20
4	Very Short Answer (VSA)	1	8	08
Total			30	70

C. Scheme of Options

There will be no overall choice

Internal choices are given in five questions. They are given in any one question of 2 marks, any one question of 3 marks and all the three questions of 5 marks weightage

D. A weightage of around 15 marks has been assigned to numericals**E. Weightage to difficulty level of questions**

S No	Estimated difficulty level	Marks Allotted
1	Easy	15%
2	Average	70%
3	Difficult	15%

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S No	UNIT	VSA (1mark)	SA I (2 marks)	SA II (3 marks)	LA (5 marks)	TOTAL
1	Physical World & Measurement	1(1)	2(1)			3(2)
2	Kinematics	1(1)	2(2)		5(1)	10(4)
3	Laws of Motion		2(2)	3(2)		10(4)
4	Work, Energy & Power	1(1)	2(1)	3(1)		6(3)
5	Motion of System of particles & Rigid Body	1(1)	2(1)	3(1)		6(3)
6	Gravitation	1(2)		3(1)		5(3)
7	Properties of Bulk Matter		2(1)	3(1)	5(1)	10(3)
8	Thermodynamics		2(1)	3(1)		5(2)
9	Behaviour of Perfect Gas & Kinetic Theory of gases		2(1)	3(1)		5(2)
10	Oscillations & Waves	1(2)		3(1)	5(1)	10(4)
	TOTAL	8(8)	20(10)	27(9)	15(3)	70(30)

IMPORTANT TOPICS:

Unit Conversions, Significant Figures

Errors in measurement, Dimensional analysis and its applications

Distance and Speed vs. Displacement and Velocity, Acceleration, Kinematic Equations

Free Fall, [Vector Components](#) ([Vector Resolution](#))

Elementary concepts of differentiation and integration , Relative Velocity

Projectile Motion-Showing the path of projectile to be parabolic

Range, Height expressions and questions based on projectile motion

[Horizontally Launched Projectiles - Problem-Solving](#)

[Non-Horizontally Launched Projectiles - Problem-Solving](#)

Uniform Circular Motion

Weight and mass, [Inertia and Mass](#)

Equilibrium (Static and Dynamic)

Newton's First Law of Motion

Newton's Second Law of Motion

Newton's Third Law of Motion

The Impulse-Momentum Change Theorem

[Momentum](#)

Momentum and Impulse Connection

Real-World Applications

The Law of Momentum Conservation

Momentum Conservation Principle; Momentum Conservation in Explosions

Friction

Connected objects; on horizontal & inclined planes

Inclined Planes

Centripetal Acceleration and Centripetal Force

Definition and Mathematics of Work

Calculating the Amount of Work Done by Forces

Potential Energy

Kinetic Energy

Mechanical Energy & it's conservation

Power

The Work-Energy Theorem

The Work-Energy Connection

Collisions- Elastic & Inelastic Collisions

Angular Measure

Center of Mass/Center of Gravity

Torque; Its relation with angular momentum & Rotational Dynamics

Law of conservation of angular momentum & examples

Radius of gyration

Statements and mathematical applications of parallel axes & perpendicular axes theorems.

Newton's Law of Gravity

Kepler's Three Laws

Variation of g with altitude and depth

Gravitational potential energy and gravitational potential

Orbital and escape velocities

Circular Motion Principles for Satellites

Mathematics of Satellite Motion

Weightlessness in Orbit

Energy Relationships for Satellites

Young's modulus, Bulk modulus and modulus of rigidity

Applications of Pascal's Law

Viscosity, Stokes law, terminal velocity, Reynold's number

Bernoulli's theorem and its applications

Surface tension, bubbles and drops

Capillary rise

What is Heat?

Methods of Heat Transfer

Rates of Heat Transfer

Measuring the Quantity of Heat

Calorimeters and Calorimetry

Newton's law of cooling

Thermodynamics: Temperature and; Thermal Energy and Heat; three fundamental laws of thermodynamics and their applications.

adiabatic process; isothermal process, heat engine, efficiency of a heat engine and refrigerator;

Kinetic Theory of Gases

Law of equipartition of energy and applications to specific heat of gases

S.H.M: Pendulum Motion, Motion of a Mass on a Spring

Properties of a Wave

The Anatomy of a Wave

Frequency and Period of a Wave

Energy Transport and the Amplitude of a Wave

The Speed of a Wave

The Wave Equation

Behavior of Waves

Boundary Behavior

Reflection, Refraction

Interference of Waves

The Doppler Effect

Standing Waves

Traveling Waves vs. Standing Waves

Formation of Standing Waves

Nodes and Anti-nodes

Harmonics and Patterns;

Mathematics of Standing Waves; closed and open pipes; Beats

Doppler-effect;

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