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PHYSICS

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## PHYSICS 11th CLASS
## MOST IMPORTANT THEORY QUESTIONS FOR CBSE

**BY**

**Asst. Prof. Tarun Kumar Gautam**

**(B.Tech, M.Tech, PhD (P))**

**Currently working in Jamia Hamdard, (HSC), Delhi**

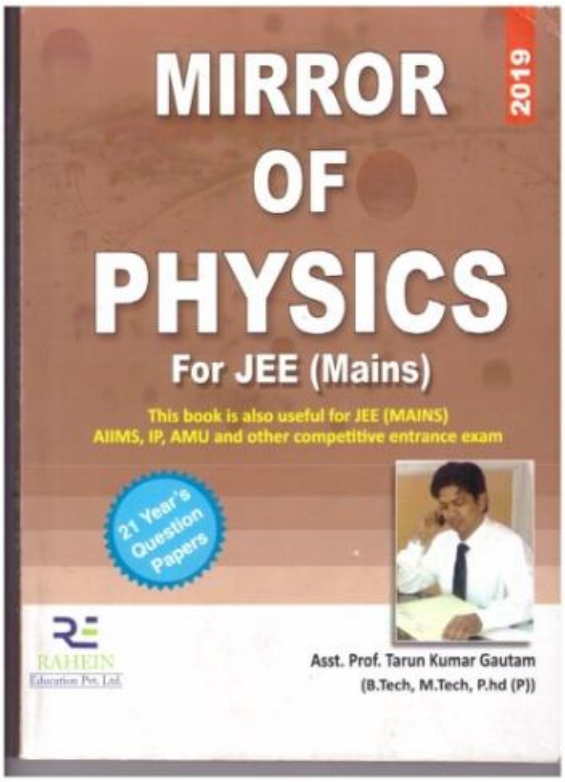
**Working on Nano Technology with Rise University, USA**

**Author of 8 books regarding Physics and Engineering Subject.**

**Ex-Faculty of Rajshree Institute of Management & Technology (RMIT), Braeilly, Uttar Prdesh**

**Ex-Faculty of Assistant professor in Krishna Engineering Collage (KEC), Ghaziabad, Uttar Prdesh**

**Member of Educational Project in University of Petroleum and Energy Studies (UPES), UK**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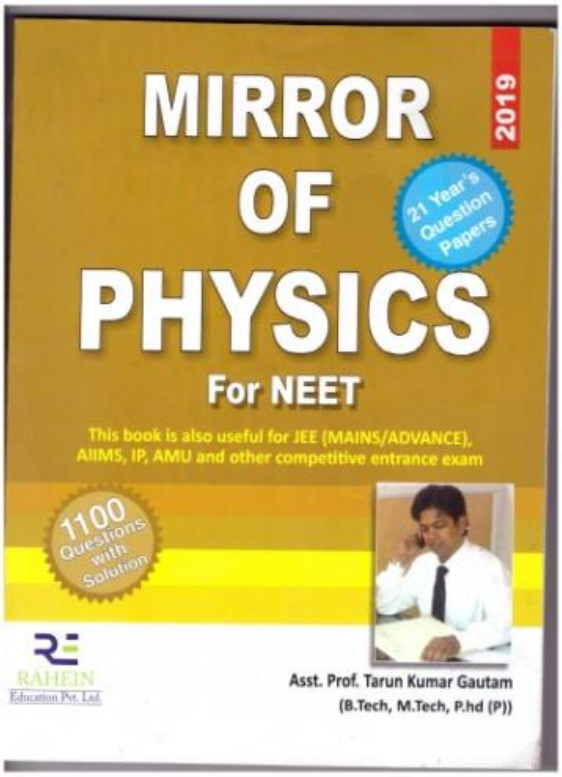
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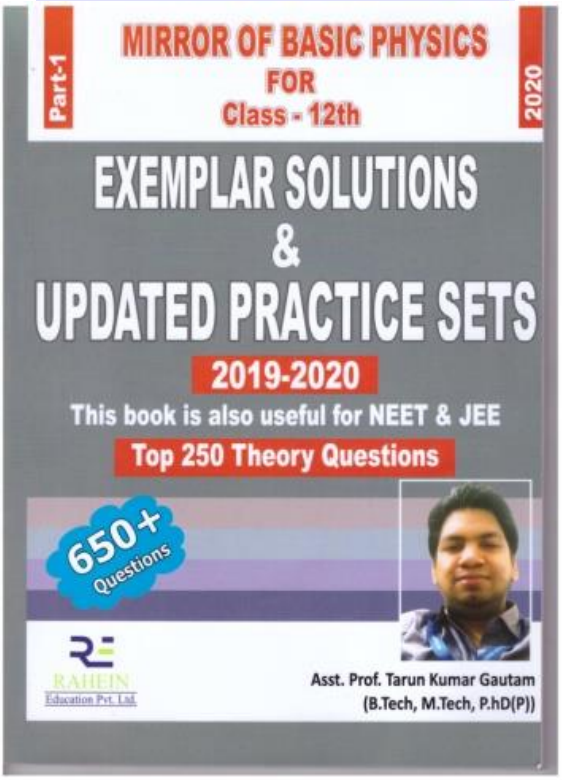
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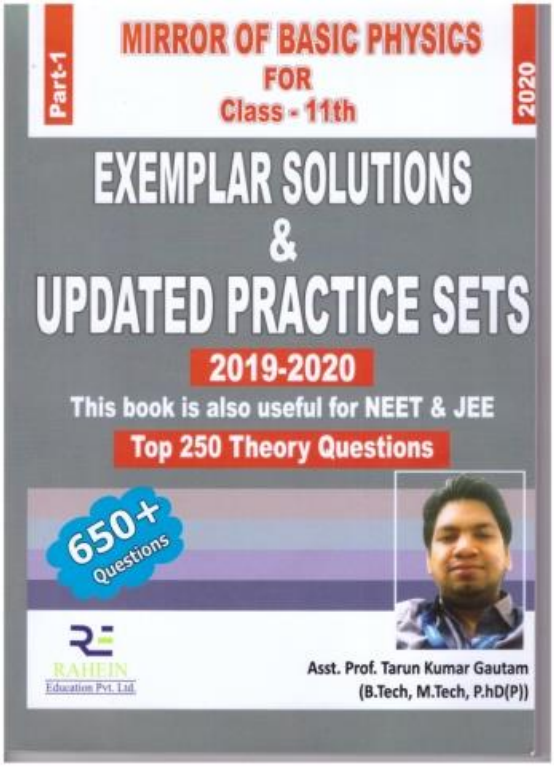
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## PHYSICAL UNITS AND DIMENSIONS AND MEASUREMENT

1) Explain the fundamental forces in Nature.
2) Explain seven fundamental units.
3) Explain (a) Astronomical unit
   (b) Light Year
   (c) Par sec
4) What is relation between (a) Light year & Astronomical unit
   (b) Par sec & Light year
5) Explain the method for measurement of large distance.
6) Explain the parallax Method with diagram.
7) Explain the Types of error.
8) Explain (a) Absolute error
   (b) Mean Absolute error
   (c) Relative error or fractional error
   (d) Percentage error
9) What is error in (a) Addition
   (b) Subtraction
   (c) Multiplication
   (d) Divide
   (e) Divide with power
10) Explain the error in y if $y = \frac{a^n}{b^m}$ .
11) What is difference between Accuracy & Precision?

## CHAPTER – 3
## MOTION IN STRAIGHT LINE

1) Explain the difference between
(a) Rectilinear and Translatory Motion
(b) Circular and Rotatory Motion
(c) Oscillatory and vibratory Motion
2) What is frame of reference ?
3) Explain the (a) one dimension motion with example
   (b) Two dimension motion with example
   (c) Three dimension motion with example
4) Explain the speed , Average speed & Instantaneous speed.

5) Find the velocity , Average velocity & Instantaneous velocity.

6) Explain the Average velocity & drive the formula for average velocity for an object move from point A to B & B to C

(a) if distance between A to B & B to C is equal

(b) if time taken A to B & B to C is same

7) Explain (a) position time graph

(b) Velocity time graph

8) What is difference between uniform & Non - uniform Motion?

9) Explain the relative velocity in one dimension & their graph.

## CHAPTER – 4
## MOTION IN TWO DIMENSIONS

1) What is type of acceleration & Instantaneous acceleration.

2) Drive the equation of Motion by the graph method & by calculus or Integration method

Or

Drive the equation of motion by calculus method

(a) $V = u + at$

(b) $S = ut + \frac{1}{2} at^2$

(c) $V^2 = u^2 + 2as$

3) Explain the distance travelled by uniform accelerated body in $n^{th}$ second

Or

$$D_n = u + \frac{a}{2}(2n - 1)$$

4) Explain the types of vectors.

5) Explain the Triangle Law of vector & parallelogram of vectors with diagram.

6) Explain (a) When a boat cross river along the shortest path

(b) When a boat cross river in shortest time

7) Explain the relative velocity of rain with respect to moving man with diagram.

8) Why lawn roller is easier to pull than push?

9) Explain the cross & dot products of vectors.

10) What is projectile motion & explain the horizontal Projectile and find their path, time of flight, horizontal range & velocity at any instant?

11) Explain the angular projectile & find

(a) Path of Projectile

(b) Time of flight

(c) Maximum height

(d) Horizontal Range

12) What is Condition for maximum range?

13) Explain the derivation for $V = r\omega$.

14) Explain (a) Centripetal acceleration

(b) Tangential acceleration

## CHAPTER – 5
## LAWS OF MOTION

1) Explain Newton Laws of Motion.

2) Explain Newton Ist Law of Motion in detail.

3) Explain Newton IInd Law of Motion and Why IInd Law of Motion is called "Real law of Motion"? And Explain consequence of it.

4) Explain IIIrd Law of Motion & derive it.

5) Explain Horse – cart problem.

6) Explain Impulse & derive it.

7) Explain case of man in lift & weightlessness condition.

8) Explain Principal of Conservation of Linear Momentum & give example of it [Recoil gun]

9) Explain Connected Motion & find Acceleration & Tention.

10) Explain Type of friction & graph.

11) Explain Angle of friction.

12) Find the work done in moving a body over a rough horizontal surface, up, down.

13) Why friction is necessary evil?

14) Explain Method to overcome the friction.

15) Explain Banking of road and Explain case of cyclist on curve road.

## CHAPTER – 6
## WORK, POWER AND ENERGY

1) Explain the work & their types.

2) Explain (i) positive work done

(ii) Negative work done

(iii) Zero work done

3) Find the relation between

(a) Joule & erg

(b) 1g – cm & erg

(c) 1kg – m & g – cm

4) What is conservative & Non – conservative force with example?
5) Find the work done by variable force.
6) Explain Power & find their units & dimensions.
7) Drive the Kinetic energy by Integration method.
8) Explain the Potential energy & find the relation with force.
9) Explain the Potential energy of spring with graph.
10) What is graph between (a) Potential energy (b) Kinetic energy (c) Total energy of spring.
11) Explain the conservation of mechanical energy with mathematically derivation & find the graph.
12) Explain the type of collision with example.
13) Explain the coefficient of restitution or coefficient of resilience.
14) Explain elastic collision in one dimension & find their velocity.
15) Explain inelastic collision in one dimension & find their velocity.
16) Explain elastic collision in two dimensions or oblique collision.
17) Explain inelastic collision in two dimensions.
18) Explain the work energy theorem.

## CHAPTER – 7
## SYSTEM OF PARTICLES AND ROTATIONAL MOTION

1) Explain the Centre of Mass between two particles and n particles of system.
2) Explain the Linear Momentum of system of particles.
3) Explain the Relation between angular velocity (w) & linear velocity (v).
4) Explain the Angular acceleration.
5) Explain the Concept of Torque or Moment of force & Explain co – ordinates form of Torque.
6) Explain the Power associated with Torque
7) Express Cartesian coordinate of angular Momentum.
8) Explain the Relation between angular momentum & Torque.
9) Explain the Equilibrium conditions of rigid bodies.
10) Explain Concept of gravity & radius of gyration.
11) Explain equation of rotation motion.
12) Explain kinetic energy of rotational.
13) Explain Torque & Moment of Inertia.
14) Explain angular Moment & Moment of Inertia.
15) Explain the Principal of Conservation of angular Momentum.
16) Explain the Theorem of Moment of Inertia.
(a) Explain the Theorem of Parallel axis.
(b) Explain the Theorem of Perpendicular axis.

17) Explain the Moment of Inertia of Circular Ring.
18) Explain the Moment of Inertia of Circular disc.
19) Explain the K.E. of rolling Motion of body with slipping and not slipping.
20) Explain the Motion of cylinder rolling without slipping on an inclined plane.

## CHAPTER - 8
## GRAVITATION

1) Explain Kepler's law of Planetary Motion.
Or
(i) Explain Ist Law of Kepler's (Law of Orbit)
(ii) Explain IInd Law of Kepler's (Law of Areas)
(iii) Explain IIIrd Law of Kepler's (Law of Periods)
2) Explain deduction of Kepler's Third Law.
3) Explain Areal Velocity of Planet.
4) Explain the Deduction of Newton's law of gravitation from Kepler's law.
5) How gravitational force follows Newton's IIIrd law?
6) Explain vector form of gravitational force.
7) Find the relationship between 'g' or 'G' or $g = \frac{GM}{R^2}$.
8) Explain the variation of acceleration due to gravity at
(i) Height or altitude
(ii) Depth
(iii) Latitude
9) What is the effect on acceleration due to gravity of shape of earth?
10) Explain (i) Gravitational field
(ii) Intensity of gravitational field
(iii) Gravitational Potential
(iv) Gravitational Potential energy
11) Find the expression for gravitational Potential & gravitational Potential energy by mathematically.
12) What is relation between gravitational Potential and gravitational field or $I = -\frac{dv}{dr}$ ?

# CHAPTER - 9
# SOLID

1) Explain (a) deforming force
   (b) Elasticity
   (c) Perfectly elastic body
   (d) Perfectly plastic body
2) Explain the stress & their types

Or

Explain (a) tensile stress
   (b) Compressive stress
   (c) Shearing stress or Tangential stress
3) Explain strain & their types
(a) Longitudinal strain
(b) Volumetric strain
(c) Shearing strain or Tangential strain
4) Explain (a) Elastic limit
   (b) Hook's Law
   (c) Elastic fatique
   (d) Compressibility
5) Explain the type of Modulus of elasticity.
6) Explain (a) young Modulus (y)
   (b) Bulk Modulus (B)
   (c) Modulus of rigidity (η) or shear modulus of elasticity
7) Explain stress & strain graph.
8) Explain the Ductile materials, Brittle materials & Elastomers on the basis of stress – strain graph & also show the graph for them.
9) Explain the Potential energy in stretched wire.
10) Explain (a) Poisson's ratio
   (b) Lateral strain
   (c) Thermal stress
11) What is the effect of compression on density of liquid?

# CHAPTER – 10
# FLUID MECHANICS

1) Explain (a) Relative density
   (b) Specific gravity of body
   & find their units & dimension
2) Explain the variation of Pressure with depth.
3) Explain Pascal's law & Explain their application.
4) Explain Hydraulic lift, hydraulic Breaks with diagram & waking.
5) Explain the Archimedes Principle & Buoyancy.
6) Explain the law of floatation.
7) Explain Inter molecular forces & their graph
8) Explain (a) Surface Tention
   (b) Surface energy
9) Explain the deviation for surface energy
10) Explain excess pressure (a) inside a liquid drop
    (b) Inside a soap bubble
11) Explain (a) angle of contact
    (b) Capillarity
12) Explain the rise a liquid in capillary tube or ascent formula.
13) Explain (a) Viscosity with dimension
    (b) Velocity gradient
    (c) Relative viscosity of liquid
14) Explain Poiseuill's formula & drive it by dimensional analysis.
15) Explain Stoke's law & drive it by dimensional analysis.
16) Explain terminal velocity & drive it by dimensional analysis.
17) Explain the variation of viscosity with (a) Temperature (b) Pressure
18) Explain the (a) Streamline flow
    (b) Laminar flow
    (c) Turbulent flow
19) Explain (a) Critical Velocity
    (b) Reynolds Number
20) Explain the Reynolds's Number for flows.
21) Explain energy of liquid.
22) Explain Bernoulli's Theorem & drive it mathematically with diagram.
23) What is venturimeter & Explain with mathematically diagram.

24) Explain the Torricell's theorem with diagram.

25) Explain the application of Bernoulli's Theorem.

## CHAPTER - 11
## THERMAL PROPERTIES OF MATTER

1) Explain (a) heat
   (b) Temperature
   (c) Latent heat

2) Explain relation between Celsius, Fahrenheight & Kelvin.

3) What is Thermal expansion & explain their types.

4) Explain (a) Linear expansion
   (b) Area expansion
   (c) Volume expansion

5) Find the relation between $\alpha$, $\beta$ and $\gamma$

Or

$6\alpha = 3\beta = 2\gamma$

6) Explain the effect of temperature on density of solids & liquids.

7) Explain (a) Specific heat capacity or specific heat
   (b) Molar specific heat or Molar heat capacity
   (c) Thermal capacity or heat capacity
   (d) Water equivalent

8) Explain the graph of variation of specific heat of a solid with temperature.

9) Explain graph of specific heat of water.

10) Explain the calorimeter & drive it.

11) Explain specific heat of gas & find their relationship.

12) Prove, why ($C_P$) is greater then $C_V$

Or

$C_P - C_V = R$

13) Explain (a) Conduction
   (b) Convection
   (c) Radiation

14) Explain coefficient of thermal conductivity & their units & dimensions.

15) Explain Newton's Law of Cooling in details.

16) Explain (a) Thermal radiation
   (b) Reflectance (r)
   (c) Absorption (a)

(d) Transmittance (t)

Find their relationship also.

17) Explain (a) green house effect

(b) Perfectly Black body

(c) Kirchoff's Law

18) Explain Stefan's Law & find their relationship with temperature of surrounding.

19) Explain Wien's displacement Law.

## CHAPTER - 12
## THERMODYNAMICS

1) Explain Zeroth Law with diagram.

2) Explain (a) Thermodynamics state variable

(b) Quasi static process

(c) Thermodynamics Process

3) What is indicator diagram?

4) What is relationship between Pressure (P) & Volume in adiabatic process & drive it by mathematically?

5) Explain the work done in isothermal expansion.

6) Explain the work done in Adiabatic expansion.

7) What is relationship between slope of adiabatic & Isothermal Process?

8) Explain first law of thermodynamics.

9) Explain cyclic Process & find their condition.

10) Explain the difference between cyclic & non – cyclic process.

11) What is the work done during cyclic process?

12) Explain heat engine & their working with diagram.

13) Explain the principle of refrigerator or heat pump with diagram.

14) Explain coefficient of performance (β).

15) Explain second law of thermodynamics.

16) Explain (a) Kelvin Plank statement

(b) Clausius statement

17) Explain reversible & irreversible process.

18) Explain carnot cycle with construction, work done & mathematically and diagram.

19) Explain the efficiency of carnot engine.

# CHAPTER - 13
# KINETIC THEORY OF GAS

1) Explain the expression for pressure due to Ideal gas.

2) Explain relationship between Pressure (P) and Kinetic energy (E) of gas

Or

$P = \frac{2}{3} E$

3) Find the average Kinetic energy per molecule of gas.

4) Explain relationship between Kinetic energy with Temperature.

5) Explain (a) Most Probable speed

(b) Mean speed

(c) Root mean speed

Find relation between them.

6) What is degree of freedom? Find the degree of freedom for (a) Monatomic gas

(b) Diatomic gas

(c) Triatomic gas

(d) Polyatomic gas

7) Find the specific heat for (a) Monatomic gas

(b) Diatomic gas

(c) Triatomic gas

(d) Polyatomic gas

8) Explain $\gamma = \left(1 + \frac{2}{n}\right)$

When 'n' is degree of freedom & $\gamma$ is specific heat

9) Explain (a) mean for path

(b) Brownian Motion

## CHAPTER – 14
## OSCILLATION

1) Explain (a) Oscillatory or Vibratory motion
   (b) Harmonic oscillation
   (c) Non – harmonic oscillation
   (d) Periodic function
   (e) Phase difference
2) Explain (a) displacement
   (b) Velocity
   (c) Acceleration
   (d) Time period

   For simple harmonic motion & explain their graphs
3) Explain Total energy of simple harmonic motion & graph.
4) Explain simple pendulum & find their time period.
5) Explain oscillation of liquid in U – tube.
6) Explain oscillation in floating cylinder.
7) Explain the oscillation of loaded spring
   (a) Vibration of horizontal spring
   (b) Vibration of vertical spring
8) Explain the oscillation of loaded spring combination.
9) Explain (a) Undamped simple harmonic oscillation
   (b) Damped simple harmonic oscillation
   (c) Free oscillation
   (d) Forced oscillation
   (e) Resonant oscillation

## CHAPTER - 15
## WAVES

1) Explain (a) Longitudinal wave motion
   (b) Transverse wave motion
2) Explain Periodic wave function & harmonic wave function.
3) Explain equation of plane simple harmonic wave.
4) Find the relationship between particles velocity & wave velocity.
5) Explain particle acceleration.

6) Explain speed of Transverse waves on stretched string.
7) Explain Newton's formula for velocity of sound in gas.
8) Explain Laplace's correction.
9) Explain density, humidity, temperature and Pressure velocity of sound.
10) Explain standing waves or stationary waves.
11) Explain formation of Nodes, Antinodes in standing waves in strings.
12) Explain standing waves in closed organ pipes.
13) Explain standing waves in open organ pipes.
14) Explain beats in details.
15) Explain Doppler's effect in details.

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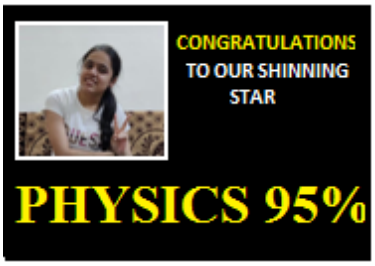


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