

Unit-1: Units and Dimensions

• List of 2 marks questions:-

1. Write down the Dimension of Power.
2. Write the Dimension of Gravitational constant.
3. State principle of Homogeneity.
4. Write down the unit of force and momentum.
5. Write down the unit and dimension of impulse and energy.
6. Write down the dimension of pressure and angular velocity.
7. What is the SI unit of Planck's constant & heat?
8. Write the Dimension of the following.
(a) wavelength (b) Kinetic energy (c) Surface Tension
9. Write the Dimension of the following.
(a) electric current (b) Resistance (c) capacitance.
10. Write the S.I unit of the following:-
(a) work (b) electric potential (c) specific heat
(d) charge.

• List of 5 marks questions:-

1. Check the accuracy of the Relation $v^2 - u^2 = 2as$
2. Check the correctness of the relation $F = G \frac{m_1 m_2}{r^2}$
3. Check the correctness of the relation $T = 2\pi \sqrt{l/g}$
4. Write all the fundamental unit with their relations.
5. Check the Dimensional correctness of the relation.
 $S = ut + \frac{1}{2} at^2$
6. Check the correctness of the relation $v = u + at$.

** questions from unit and dimension can also come from the following physical quantity.

- (1) Potential energy (2) latent heat (3) Acceleration (4) charge
- (5) Density (6) Moment of inertia (7) Stress, Strain (8) Angular velocity.

Unit-2: Scalars and Vectors

List of 2 marks questions:-

1. Define Scalar and Vector with examples.
2. Define co-initial and co-planned Vectors with example.
3. Define parallel and Anti-parallel Vectors.
4. Which of the following is a Scalar quantity:-
(a) Force (b) Momentum (c) Pressure (d) displacement.
5. Which of the following is a Vector quantity:-
(a) Acceleration (b) Distance (c) Speed (d) Time.
6. If $\vec{A} \perp \vec{B}$, then the value of $\vec{A} \cdot \vec{B} =$ _____
7. Define equal Vectors and negative Vectors.
8. When $\vec{A} \parallel \vec{B}$, then the value of $\vec{A} \times \vec{B} =$ _____

List of 5-marks questions.

1. If $\vec{A} = 2\hat{i} - \hat{j} + 7\hat{k}$ and $\vec{B} = 7\hat{j} - \hat{k}$, then find $\vec{A} \cdot \vec{B}$ and $\vec{A} \times \vec{B}$.
2. Find the angle between two Vectors given by,
 $\vec{A} = 2\hat{i} - \hat{j} + 3\hat{k}$, $\vec{B} = \hat{i} + \hat{j} - 7\hat{k}$
3. If the x-component of a force of 25N is 5N, then find its y-component using the concept of resolution of Vectors.
4. If two forces of 5N & 10N acting at an angle 120° , then find the magnitude of their resultant.
5. If two Vectors $\vec{A} = 2\hat{i} + 7\hat{j} + c\hat{k}$ and $\vec{B} = 2\hat{i} - \hat{j} - \hat{k}$ are perpendicular to each other, then find the value of 'c'.
6. State Triangle / Parallelogram law of Vector addition.

Unit-3: Kinematics.

• List of 2-marks questions:-

1. Explain the concept of rest and motion.
2. Define displacement and Velocity.
3. Define force and find its dimension.
4. Define acceleration with its formula.
5. Write down the three equations of motion under gravity.
6. Define circular motion with example.
7. Define projectile, give two examples.

• List of 5-marks questions:-

1. Find the length of the train running at the speed of 60 km/hr which crosses a pole in 9 seconds.
2. Derive the relation between linear Velocity and angular Velocity.
3. Derive the relation between linear acceleration & angular acceleration.
4. A train 200 meters long and travelling at a speed of 60 km/h . In how many seconds did the train cross a bridge of 200 meters.

• Long questions (20 marks)

1. Find the expression for equation of trajectory, time of flight, maximum height, horizontal range and condition for maximum horizontal range for a projectile fired at an angle θ with horizontal.

Unit-4: Work & Friction

List of two marks questions:-

1. Define work and its SI unit.
2. Define friction and give any two examples about frictional forces acting between two objects.
3. Define the coefficient of friction.
4. A 200kg block rest on a ~~plate~~ plane whose coefficient of friction $\mu = 0.25$, find the value of applied force.
5. If the force of 50N is applied on a block resting on a surface, which is 2kg, find the coefficient of friction μ .

List of 5-marks questions:-

1. State the laws of limiting friction.
2. Write down the types of friction and define them.
3. Write any two methods of reducing friction with proper explanation.

Long question (10 marks)

1. State the laws of limiting friction, and write down the methods to reduce friction, explain them individually.

Unit-5: Gravitation.

List of 2-marks Questions :-

1. Define Universal Gravitational constant.
2. Define acceleration due to gravity (g).
3. How the value of gravity ' g ' varies with altitude and depth (only expression).

List of 5-marks Questions :-

1. State and explain Newton's law of gravitation.
2. Derive the relation between acceleration due to gravity (g) and Universal Gravitational constant (G).
3. Distinguish between mass and weight.
4. State Kepler's laws of planetary motion with proper diagrams.

Unit-6: Oscillations and Waves.

List of 2-marks Questions :-

1. Define Simple Harmonic motion with examples.
2. Define wave motion and wave length.
3. Define Amplitude of a wave.
4. Define frequency and Time period of wave with their units (SI SYSTEM).
5. Derive the relation between Velocity, frequency and wavelength of a wave.
6. Define ultrasonic and Give two Applications.

Continuing Unit-6.

- List of 5-marks questions:-
- 1. Find the expression for displacement, Velocity & acceleration of a body executing SHM.
- 2. Write the difference between Transverse and Longitudinal wave motion.
- 3. Write the properties of ultrasonic wave.

Unit-7: Heat and Thermodynamics.

- List of 2-marks questions.
- 1. Define heat & Temperature. What is the basic difference between them?
- 2. What are the units of heat in various systems of units (SI, MKS, CGS).
- 3. Define the specific heat and find its dimension.
- 4. Define latent heat, write its unit & dimensions.
- 5. Define coefficient of linear expansion (α).
- 6. Define coefficient of superficial expansion (β).
- 7. Define coefficient of cubical expansion (γ).
- 8. Define Joule's mechanical equivalent of heat.
- 9. Write the relation between work and heat.
- 10. Define Thermal expansion.
- 11. Calculate the amount of heat required to raise the temperature of 1 kg of iron block from 90° to 120° C.
(Given, Specific heat of iron $\rightarrow 460 \text{ J/Kg } ^\circ\text{C}$.)

Continuing Unit-7

• List of 5-marks questions:-

1. Derive the relation between α and β for a Solid.
2. Derive the relation between coefficient of linear (α) and cubical (γ) of a Solid.
3. Explain the concept of expansion of Solid.
4. State & explain first law of Thermodynamics.

• Long Questions (10 marks):-

1. How much Steam at 100°C will melt 2.2 Kg of ice at -20°C ? Given that Specific heat of ice = $0.5\text{ Kcal/Kg}^\circ\text{C}$
Latent heat of Steam = 540 Kcal/Kg
Latent heat of ice = 80 Kcal/Kg .
2. Define joule's mechanical equivalent of heat? Determine the specific heat of an unknown substance, if a 2.50 g sample release 12 calories as its temperature changes from 25°C to 30°C .
3. Define the coefficient of linear & cubical expansion of Solids. Define the relation between α , β & γ .
where, α = coefficient of linear expansion in Solid.
 β = coefficient of Superficial expansion in Solid.
 γ = coefficient of cubical expansion in Solid.

Unit-8: Optics

• List of 2-marks questions :-

1. Define reflection with proper ray diagram.
2. Define refraction with proper ray diagram.
3. Define refractive index with its formula.
4. Draw the ray diagram for refraction through prism.
5. Define optical fibre, with two applications.

• List of 5-marks questions :-

1. Define reflection with its law of reflection.
2. Define refraction & law of refraction.
3. Define critical angle and Total internal reflection.
4. Define optical fibre and write down its properties.

Unit-9: Electrostatics & Magnetostatics

• List of 2-marks questions :-

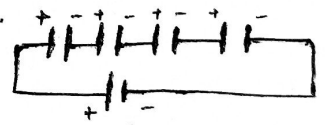
1. Define electrostatics.
2. Define relative permittivity and its formula.
3. Define absolute permittivity and its units.
4. Define unit charge in electrostatics.
5. Define electric potential & its formula with its unit.
6. Define potential difference. How it is different from electric potential.

Continuing Unit-9

7. Define electric field intensity, write its formula and units (SI).
8. Define capacitance of a capacitor. Give an expression for finding effective capacitance of series combination of capacitor.
9. If $2\mu\text{F}$ and $3\mu\text{F}$ are two capacitance of two capacitors connected in series, find their combined capacitance.
10. Define unit pole in magnetostatics.
11. Define magnetic field and magnetic field intensity, also provide their units.
12. Define magnetic flux (Φ). At what condition the flux is maximum?

List of 5-marks Questions :-

1. State and explain Coulomb's law in electrostatics.
2. Find the combined capacitance of a circuit, when four capacitors of capacitance $1\mu\text{F}$, $2\mu\text{F}$, $3\mu\text{F}$ and $5\mu\text{F}$ are connected in series.
3. Explain the properties of magnet.
4. State Coulomb's law in magnetism, here define unit pole.
5. Explain all the properties of magnetic lines of force.



Long Questions (10-marks) :-

1. Define magnetic flux. Find the magnitude of flux (Φ) at different conditions. Write & explain the properties of lines of force.

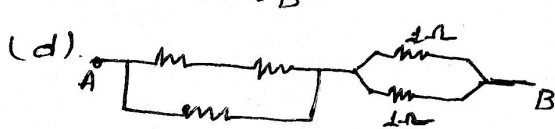
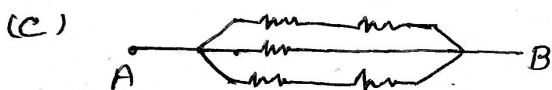
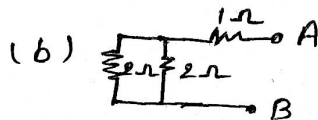
Unit 10 - current electricity

List of 2-marks questions:-

1. Define electric current and write its unit (SI).
2. Write the general expression for Series and parallel combination of resistors.
3. State ohm's law for electric circuit.
4. Write any two applications of ohm law.

List of 5-marks questions:-

1. Find the equivalent resistance of the following:-

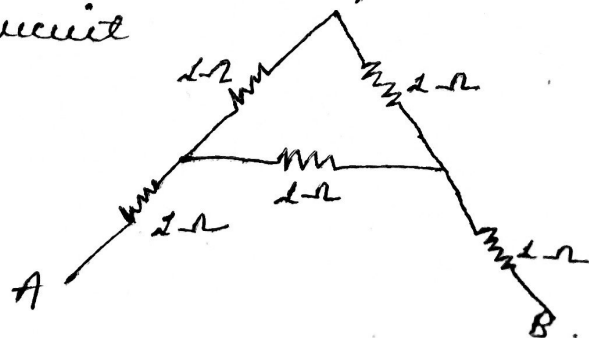


here, each bit can a question of 5-marks, one has to find the Equivalent between the points A & B.

2. State and explain Kirchhoff's current law & Voltage law with neat circuit diagrams.
3. State ohm's law & its application.

Long questions (10 marks):-

1. State Kirchhoff's Voltage law. Define the condition of balance Wheatstone's bridge.
2. State Kirchhoff's current law. Find the equivalent resistance of two given circuit



Unit-11: Electromagnetism & Electromagnetic Induction

• List of 2-marks questions:-

1. Define electromagnetism.
2. Define Lenz's law.
3. State Fleming's right hand rule.

• List of 5-marks questions:-

1. Write down the difference between Fleming's right hand rule and Fleming's left hand rule.
2. State Faraday's laws of electromagnetic induction.

• Long question (10-marks):-

1. Find the expression for force acting on a current carrying conductor placed in a uniform magnetic field.

Unit-12: Modern Physics

• List of 2-marks questions:-

1. Define laser and its full form.
2. Write down the application of laser.
3. Define sound waves, Sky waves and Space waves.

• List of 5-marks questions:-

1. Explain the principle of laser.
2. Write down the properties & application of Laser.

3. Define Population inversion.