XI – STD – PUBLIC QUESTIONS UNITWISE AND IMPORTANT QUESTIONS

1. NATURE OF PHYSICAL WORLD AND MEASUREMENT

PART -II

1. Define the SI unit of current.
2. What are fundamental quantities ? Give examples. **(Oct – 20)**
3. What are derived quantities ? Give examples
4. Define the SI unit of time.
5. Define the SI unit of mass
6. What is light year? **(Mar – 18)**
7. Distinguish between fundamental units and derived units
8. Write any two errors of systematic errors. Explain them. **(Mar – 19)**
9. State the principle of homogeneity of dimensions. **(Mar – 19, June -23)**
10. Check the correctness of the given equation $v = u + at$ using dimensional analysis**(Aug -21)**
11. Check the correctness of the given equation $v^2 = u^2 + 2as$ where u - initial velocity , v - final velocity, a- acceleration and s – displacement
12. Check the correctness of the given equation $s = ut + \frac{1}{2}at^2$ where s – displacement u - initial velocity , a- acceleration and t – time
13. Check the correctness of the equation $E = mC^2$ using dimensional analysis **(July – 19)**
14. Check the correctness of the equation $\frac{1}{2}mv^2 = mgh$ using dimensional analysis **(Mar – 20)**
15. In a submarine equipped with sonar, the time delay between the generation of a pulse and its echo after reflection from an enemy submarine is observed to be 80 s. If the speed of sound in water is 1460 ms^{-1}. What is the distance of enemy submarine? **(May – 22)**
16. Write any two limitations of dimensional analysis ? **(Aug - 22)**
17. What is the rules for determining Significant figures

PART - III

1. Determine the distance of the Moon from Earth by parallax method
2. What are the advantages of SI system?
3. Determine the height of an accessible object using triangulation method**(Mar – 20,June -23)**
4. Write a note on radar method to measure larger distances**. (Mar-20)**
5. Define precision and accuracy. Explain with one example.
6. What is Significant figures ? Explain any five rules governing them with an example
7. Write about dimensional variables and dimensionless variable with an example **(Oct – 20)**
8. What are the applications of dimensional analysis? **(Aug -21)**
9. If the value of universal gravitational constant in SI is 6.6×10^{-11} $Nm^2 kg^{-2}$, then find its value in CGS System
10. Convert a velocity of 72 kmh^{-1} into ms^{-1}
11. What are the limitations of dimensional analysis ? **(July -19)**
12. What is meant by Gross error? How shell we minimize it? **(Aug – 22)**
13. What is Gross error? State the reasons for it and how to minimize the errors.**(Mar – 23)**

PART - IV

1. In a series of successive measurements in an experiment, the readings of the period of rotation of a wheel were found out to be 2.15s, 2.25 s, 2.28s and 2.32s. Calculate (i) the mean value of the period of rotation (ii) the absolute error in each measurement (iii) the mean absolute error (iv) the relative error (v) the percentage error. Express the result in proper form.**(July – 19)**
2. i). What are the uses of dimensional analysis ? **(Oct – 20)**
   ii) Convert 76 cm of mercury pressure into Nm^{-2} using the method of dimensions
3. What is an error ? Explain the systematic errors **(June – 23)**

4. What do you mean by propagation of errors? Explain the propagation of errors in addition and multiplication.
5. Using dimensional analysis derive an expression for the period of a simple pendulum. The time period depends on
   i) mass 'm' of the bob ii) length 'l' of the pendulum
   iii) acceleration due to gravity 'g' at the place where the pendulum is suspended (Constant K = 2π)
6. Obtain by dimensional analysis an expression for the surface tension of a liquid rising in a capillary tube. Assume that the surface tension T depends on mass m of the liquid, pressure P of the liquid and radius r of the capillary tube (K= $\frac{1}{2}$) **(Mar -18)**
7. Explain the principle of homogeneity of dimensions and derive the force acting on a body moving in a circular path depends on the mass of the body(m), velocity v and the radius r of the circular path. Obtain an expression for the force by dimensional analysis (K=1)**(Mar – 19)**
8. What do you mean by propagation of errors? Explain the propagation of errors in division of two quantities. **(Mar– 20)**
9. Convert 76 cm of mercury pressure into Nm^{-2} using the method of dimensions.**(Aug - 21)**
10. i) What are the applications of dimensional analysis? **(May – 22)**
    ii) Check the correctness of the equation $\frac{1}{2}mv^2 = mgh$ using dimensional analysis
11. Write a note on triangulation method and radar method to measure larger distances. **(Aug - 22)**

2- Kinematics
PART –II

1. What is projectile? Give two examples.**(Mar – 19)**
2. Define a vector. Give examples
3. Define a scalar. Give examples **(Mar-23)**
4. What is the difference between scalar and vector? Give examples.**(July – 20)**
5. State triangle law of addition.
6. Write a short note on the scalar product between two vectors.
7. Write a short note on vector product between two vectors.
8. How do you deduce that two vectors are perpendicular?
9. Define displacement and distance.**(Mar – 20)**
10. Define velocity and speed.
11. Define acceleration
12. What is the difference between velocity and average velocity **(June - 23)**
13. Define a radian?
14. Define angular velocity **(Aug – 21)**
15. Define angular displacement and angular velocity.
16. What is non uniform circular motion?
17. Write down the kinematic equations for angular motion.
18. Write down the expression for angle made by resultant acceleration and radius vector in the non uniform circular motion.
19. An electron moving with velocity 2.2×10^6 m/s , revolving in circular orbit of radius 0.53 Å. Calculate its angular velocity **(July – 19)**
20. Consider two trains A and B moving along parallel tracks with the same velocity in the same direction. Let the velocity of each train be 50 km h^{-1} due east. Calculate the relative velocities of the trains. **(Aug – 22)**
21. The position vector and angular velocity of a particle executing uniform circular motion at an instant are $2\hat{\imath}$ and $4\hat{k}$ respectively. Find its linear velocity at that instant.**(Oct – 20)**

PART -III

1. Show that path of the projectile is a parabola in horizontal projection**(Aug-21,22).**
2. What is the torque of the force $\vec{F} = 3\hat{\imath} - 2\hat{\jmath} + 4\hat{k}$ acting at a point $\vec{r} = 2\hat{\imath} + 3\hat{\jmath} + 5\hat{k}$ about the origin? **(Mar -19)**
3. What are the resultants of the vector product of two vectors given by $\vec{A} = 4\hat{\imath} - 2\hat{\jmath} + \hat{k}$ and $\vec{B} = 5\hat{\imath} + 3\hat{\jmath} - 5\hat{k}$ **(May- 22)**
4. An object is thrown with initial speed $5ms^{-1}$ with an angle of projection 30°. Calculate the maximum height reached and horizontal range.**(Mar -20)**
5. A train was moving at the rate of 54 kmh^{-1} when brakes were applied . It comes to rest with a distance of 225m. Calculate the retardation produced in the train. **(Oct – 20, June -23)**
6. Write the properties of scalar product of two vectors **(Mar – 23)**
7. Define time of flight and horizontal range of the projectile.
8. Derive the relation between linear velocity and angular velocity

PART –IV

1. i) Write down the equation of a freely falling body under gravity **(Mar – 19)**
   ii) A ball is thrown vertically upwards with the speed of $19.6ms^{-1}$ from the top of the building and reaches the earth in 6s. Find the height of the building
2. Derive the expression for centripetal acceleration. **(Mar -20)**
3. Derive the linear kinematic equations of motion for constant accelerated motion **(Oct-20, Aug-21, May-22, June -23)**
4. Explain in detail the triangle law of addition. **(July – 19, Aug – 22, Mar - 23)**
5. What is scalar product? Discuss the properties of scalar product.
6. What is vector product? Discuss the properties of vector product.
7. Derive the equations of motion for a particle projected vertically.
8. Derive the equation of motion, range and maximum height reached by the particle thrown at an oblique angle θ with respect to the horizontal direction.
9. Derive the expression for total acceleration in the non uniform circular motion

3. Laws of motion

PART -II

1. State Newton's second law of motion.**(Mar – 19,May - 22)**
2. State Lami's theorem **(July -19)**
3. A book of mass m is at rest on the table. Draw the free body diagram for the book. **(Aug-21)**
4. Explain the applications of angle of repose
5. Define one newton.
6. Define Inertia**(Aug – 22)**
7. Define angle of repose
8. What is banking of tracks?
9. What is the meaning of "Pseudo force" **(June -23)**
10. Under what condition will a car skid on a leveled circular road? **(Mar – 23)**

PART -III

1. A car takes a turn with velocity 50 ms^{-1} on the circular road of radius of curvature 10 m. calculate the centrifugal force experienced by a person of mass 60kg inside the car? **(Mar -19, June -23)**
2. Explain various types of friction. Suggest a few methods to reduce friction **(Mar -19)**
3. A child is playing in a sliding board if he is sliding down. **(July -19)**
   i) Mention the forces acting on the child ii) Draw FBD (free body diagram) iii)Write the force equation
4. Find the maximum speed at which a car turns round a curve of 36m radius on a level road. Given the coefficient of friction between tyre and road is 0.53**(July -19)**
5. When a cricket player catches the ball, he pulls his hand in the direction of the ball's motion. Why? **(Mar – 20)**

6. When walking on ice one should take short steps. Why? **(Oct – 20)**
7. What are the salient futures of static friction and kinetic friction?**(Aug -21)**
8. Explain the concept of inertia. Write two examples each for inertia of motion, inertia of rest and inertia of direction.
9. Using free body diagram, show that it is easy to pull an object than to push it**(May – 22)**
10. State Newton's three laws of motion.**(Aug -22)**
11. What is angle of friction? Derive the expression for it
12. What is the difference between centripetal force and centrifugal force **(Mar – 23)**
13. A fly wheel rotates with a uniform angular acceleration. Its angular velocity increases from 20π rad / s to 40 π rad / s in 10 seconds, find the number of rotations in that period **(June-23)**

PART -IV

1. Explain the motion of blocks connected by a string in Vertical motion**(July -19,May - 22)**
2. Explain the need for banking of tracks **(Aug-21)**
3. State Newton's three laws of motion and discuss their significance **(June-23)**
4. Under what condition will a car skid on a leveled circular road?
5. Describe the method of measuring angle of repose **(Aug – 22)**
6. Show that in an inclined plane, angle of friction is equal to angle of repose **(Mar – 23)**
7. Prove the law of conservation of linear momentum. Use it to find the recoil velocity of a gun when a bullet is fired from it. **(Mar – 19, Oct -20)**

4. Work, Energy and Power

PART -II

1. What is potential energy?
2. State law of conservation of energy.
3. Define –Power .Give its unit
4. Define –unit of power
5. Calculate the energy consumed in electrical units when a 75 W fan is used for 8 hours daily for one month(30 days) **(Aug – 21)**
6. Define coefficient of restitution **(Mar – 20)**
7. Write any two difference between conservative and non – conservative force **(Mar – 23)**

PART -III

1. A heavy body and a light body have same momentum. Which one of them has more kinetic energy and why? **(Mar -19)**
2. Distinguish between elastic and inelastic collision **(Oct – 20, May -22)**
3. Derive the relation between momentum and kinetic energy **(Aug – 21, Aug - 22)**
4. What are the types of collision? Give examples
5. Derive the expression for energy loss in inelastic collision
6. State the various types of potential energy? Explain its formula? **(Mar – 23, June -23)**
7. Two objects of masses 3 kg and 6 kg are moving with the same momentum of 30 kg m s^{-1}. Will they have same kinetic energy? **(Mar – 23)**

PART -IV

1. What is elastic collision? Derive an expression for final velocities of two bodies which undergo elastic collision in one dimension **(Mar – 19)**
2. i) Derive the relation between momentum and kinetic energy **(Oct – 20)**
   ii) Two objects of masses 2 kg and 4 kg are moving with the same momentum of 20 kg m s^{-1}.
   (a) Will they have same kinetic energy?
   (b) Will they have same speed? Prove it

3. i) Derive the relation between momentum and kinetic energy
   ii) Two objects of masses 3 kg and 6 kg are moving with the same momentum of 30 kg m s^{-1}.
   (a) Will they have same kinetic energy?
   (b) Will they have same speed? Prove it. **(July -19)**
4. State and explain work – Energy principle. Mention the inferences of work kinetic energy theorem **(Mar–20,Aug–21,May – 22,June - 23)**
5. What is inelastic collision? Derive an expression for loss of kinetic energy in perfect inelastic collision. **(Aug–22)**
6. Derive the relation between power and velocity? **(Mar – 23)**

5. Motion of System of Particles and Rigid Bodies

PART -II

1. Why it is more difficult to revolve a stone tied to longer string than a stone tied to a shorter string? **(Mar – 19)**
2. Define center of mass **(Aug – 22)**
3. Define torque and mention its unit.
4. Define torque . Give any two examples of torque in day-to-day life **(May -22)**
4. Give any two examples of torque in day-to-day life. **(Aug – 21)**
5. What is radius of gyration? **(Oct – 20)**
6. Define couple. Give example
7. State the law of conservation of angular momentum **(Mar – 20, May -22)**
8. Define couple. Give example
9. Define center of gravity **(July -19, Aug – 21))**
10. What are the conditions in which Force can not produce Torque? **(Mar -23)**

PART -III

1. Find the rotational kinetic energy of a ring of mass 9 kg and radius 3 m rotating with 240 rpm about an axis passing through its centre and perpendicular to its plane. **(Mar – 19)**
2. A force $(4\hat{\imath} - 3\hat{\jmath} + 5\hat{k})$N is applied at a point whose position vector is $(7\hat{\imath} + 4\hat{\jmath} - 2\hat{k})$m. Find the torque of force about origin **(Mar – 20)**
3. Derive an expression for kinetic energy of a rigid body in rotational motion**(Oct – 20)**
4. Define center of gravity. **(Aug – 21)**
5. What is the relation between torque and angular momentum?
6. State principle of moments.
7. Explain the type of equilibrium with suitable examples **(Oct – 20)**
8. An electron of mass 9.1×10^{-31}kg revolves round the nucleus in a circular orbit of radius 0.53 Å. What is the angular momentum of the electron? (velocity of the electron v =2.2×10^{6} m/s) **(Aug -22)**
9. What are the differences between sliding and slipping **(June – 23)**

PART -IV

1. State and prove parallel axis theorem **(Mar – 19)**
2. Explain why a cyclist bends while negotiating a curve road? Arrive at the expression for angle of bending for a given velocity. **(Mar -20)**
3. Derive the expression for moment of inertia of a rod about its center and perpendicular to the axis of the rod **(Mar -20, Aug–22, Mar - 23)**
4. Derive an expression for kinetic energy in Rotation **(Aug – 21)**
5. Discuss rolling on inclined plane and arrive at the expression for the acceleration**(May – 22)**

6. Gravitation

PART – II

1. Define – gravitational potential **(May – 22)**
2. Why there is no lunar eclipse and solar eclipse every month? **(Mar – 20, June -23)**
3. State universal law of gravitation ? **(Oct – 20,Mar – 23)**
4. Why is the energy of the satellite or any other planet negative? **(Aug – 21)**
5. What is meant by Escape speed in the case of the Earth? **(Aug – 22)**
6. Explain geostationary satellites? **(Mar – 23)**
7. State Helio centric model
8. The energy of a satellite is negative. Why ?
9. What is Geo centric model ?
10. Define gravitational potential energy.

PART – III

1. State Kepler's three laws in planetary motion **(July -19,Mar - 20)**
2. Obtain an expression for the gravitational potential.
3. Explain the variation of the g with altitude
4. Explain the variation of the g with lattitude
5. Derive the expression for the energy of the satellite.**(Aug -22)**
6. Suppose we go 200km above and below the surface of the Earth , what are the g values at these points? In which case , is the value of g small? **(Oct – 20)**
7. What do you mean by weightlessness? Explain the state of weightlessness of a freely falling body.**(Mar – 19)**
8. Write a shirt note on polar satellites. **(May – 22)**

PART – IV

1. Derive the expression for orbital speed and time period of a satellite **(Oct – 20)**
2. i) What is orbital velocity ? Obtain an expression for it. **(Mar – 19)**
   ii) Calculate the value of orbital velocity for an artificial satellite of earth orbiting at a height of 100 km. (Mass of the earth = 6×10^{24} kg. , radius of the earth = 6400 km)
3. i) Derive the expression for variation of acceleration due to gravity (g) with depth from the surface of earth (d) . **(Mar – 20,Aug - 21)**
   ii) Find the ratio of the acceleration due to gravity at height R/2 from the surface of earth to the value at a depth R/2 from the surface of the earth (R – radius of earth)
4. Prove that at the points near the surface of earth, the gravitational potential energy of the object is U = mgh
5. What is escape speed ? Obtain an expression for it. **(July -19,June -23)**
6. Explain the variation of the g with altitude **(May – 22)**
7. Explain the variation of the g with depth from the earth surface. **(Aug -22,Mar - 23)**

7. Properties of Matter

PART – II

1. The surface tension of a soap solution is 0.03 Nm^{-1}. How much work is done in producing soap bubble of radius 0.05m ? **(Mar -19)**
2. What is Reynold's number? Give its importance **(July – 19, Mar - 22)**
3. A metal cube of side 0.20 m is subjected to a shearing force of 4000 N. The top surface is displaced through 0.50 cm with respect to the bottom. Calculate the shear modulus of elasticity of the metal.**(Oct – 20)**
4. State Hooke's law of elasticity.**(Aug – 22)**

5. Define – Poisson's ratio **(Mar -23)**
6. *Define – coefficient of viscosity*
7. *Define – Surface tension*
8. *Define - angle of contact.*
9. *What is terminal velocity?*
10. *Define elastic limit*
11. *State Pascal's law in fluids.*
12. *State Archimedes principle*
13. *State the law of floatation*

PART – III

1. Derive an expression for a terminal velocity of a small sphere falling through a viscous liquid.**(Mar -19)**
2. We use straw to suck soft drinks. Why? **(Mar – 20)**
3. Explain any three factors affecting surface tension of a liquid. **(July – 19, June -23)**
4. Write any three applications of surface tension. **(Oct – 20)**
5. If excess pressure is balanced by a column of oil with specific gravity 0.8, 4 mm high where R = 2.0 cm , find the surface tension of the soap bubble. **(Aug – 21)**
6. Give any three applications of viscosity **(May – 22)**
7. Distinguish between streamlined flow and turbulent flow. **(Aug – 22)**
8. Give the practical applications of capillarity **(Mar -23)**
9. A metal cube of side 0.20 m is subjected to a shearing force of 4000 N. The top surface is displaced through 0.50 cm with respect to the bottom. Calculate the shear modulus of elasticity of the metal
10. Explain any one applications of Bernoulli's theorem.
11. Obtain the expression the excess pressure in side a liquid drop
12. *Establish the relation between surface tension and surface energy.*

PART – IV

1. State and prove Bernoulli's theorem for a flow of incompressible, non- viscous and streamlined flow of liquid. **(Mar -19, Aug – 21,June - 23)**
2. Derive an expression for a terminal velocity of a sphere moving in a highly viscous fluid, using Stoke's formula.. **(Mar – 20 , Mar - 23)**
3. Explain the different types of Moduli of elasticity **(July – 19)**
4. Derive an expression for surface tension of a liquid by capillary rise method **(May – 22)**
5. Derive Poiseuille's formula for the volume of the liquid flowing per second through a pipe under streamline flow **(Oct – 20, Aug – 22).**

8. Heat and Thermodynamics

PART – II

1. State Stefan-Boltzmann law and write its expression **(Mar – 19, Aug – 21, Aug- 22)**
2. Define Specific heat capacity**. (July – 19)**
3. During cyclic process , a heat engine absorbs 500 J of heat from a hot reservoir, does work and ejects an amount of heat 300J into the surroundings(cold reservoir). Calculate the efficiency of the heat engine**.(Mar – 20)**
4. What is PV – diagram **(Oct - 20)**
5. State Wien's Displacement law **(Aug – 21, May -22)**
6. State Zeroth law of thermodynamics. **(Mar – 23)**
7. *State the first law of thermodynamics.*
8. *State Kelvin-Planck statement of second law of thermodynamics*
9. *What is isobaric process? Give examples*

10. Define latent heat capacity. Give its unit.
11. Define the coefficient of performance

PART – III

1. Explain linear expansion of solid **(Mar-19)**
2. What are the conditions for reversible process? **(Mar -20)**
3. Why does heat flow from hot object to cold object? **(Oct – 20)**
4. A person does 30 kJ work on 2 kg of water by stirring using a paddle wheel. While stirring, around 5 kcal of heat is released from water through its container to the surface and surroundings by thermal conduction and radiation. What is the change in internal energy of the system? **(May -22)**
5. During a cyclic process, a heat engine absorbs 500 J of heat from a hot reservoir, does work and ejects an amount of heat 300 J into the surroundings (cold reservoir). Calculate the efficiency of the heat engine? **(Aug – 22, June -23)**
6. During a cyclic process, a heat engine absorbs 600 J of heat from a hot reservoir, does work and ejects an amount of heat 200 J into the surroundings (cold reservoir). Calculate the efficiency of the heat engine? **(Mar – 23)**
7. Derive the expression for the work done in an isothermal process
8. *Derive the expression for Carnot engine efficiency*
9. *Distinguish between isothermal process and adiabatic process*
10. *State and explain Prevost theory of heat exchange*
11. Explain Calorimetry and derive an expression for final temperature when two thermodynamic systems are mixed.
12. Define molar specific heat capacity. Give its unit. **(June -23)**

PART – IV

1. Derive Mayer's relation for an ideal gas.**(Mar- 19, Mar – 23)**
2. State ideal gas laws. Derive equation of state for ideal gas **(July – 19)**
3. Derive the expression for the work done in an adiabatic process **(Mar – 20)**
4. What is thermal expansion? Explain the three types of thermal expansion and obtain the relation between them **(Oct – 20)**
5. Explain in detail Newton's law of cooling. **(Aug – 21,22)**
6. Explain in detail the working of a refrigerator? **(June-23)**
7. Explain in detail Carnot heat engine

9. Kinetic Theory of Gases

PART – II

1. List the factors affecting Brownian motion.**(Mar – 19)**
2. Define root mean square speed **(July – 19)**
3. Why there is no hydrogen in the Earth atmosphere? **(Mar – 20)**
4. List the factors affecting the mean free path**(Oct – 20)**
5. Define the degrees of freedom **(May – 22)**
6. State the law of equipartition of energy. **(June -23)**
7. Define mean free path and write down its expression.
8. Deduce Charles' law based on kinetic theory.
9. Deduce Boyle's law based on kinetic theory.
10. Deduce Avogadro's law based on kinetic theory.

PART – III

1. Define the degrees of freedom. Give an example. **(July – 19) (Aug – 21)**
2. Write any six postulates of kinetic theory of gases. **(Mar-19, Oct – 20, Mar - 23)**
3. Ten particles are moving at the speed of 2, 3, 4, 5, 5, 5, 6, 6, 7 and 9 m s^{-1}. Calculate root mean speed(V_{rms}) and most probable speed (V_{mp}). **(June -23)**
4. *What is the relation between the average kinetic energy and pressure?*
5. Describe the total degrees of freedom for monoatomic molecule, diatomic molecule and triatomic molecule
6. Derive the ratio of two specific heat capacities of monoatomic, diatomic and triatomic molecule.

PART – IV

1. Derive the expression of pressure exerted by the gas on the walls of the container.**(Mar – 23)**
2. State and explain equipartition of energy **(May – 22)**
3. Explain in detail the kinetic interpretation of temperature.**(Aug – 22)**

10. Oscillations

PART – II

1. Soldiers are not allowed to march on a bridge. Give reason.**(Mar – 19)**
2. A particle executing SHM covers a displacement of half of amplitude in one second. Calculate its time period. **(July- 19)**
3. If the length of the pendulum is increased by 44% from its original length, calculate the percentage increase in time period of the pendulum.**(Mar- 20)**
4. Define frequency of simple harmonic motion. **(Aug – 21)**
5. What is meant by periodic and non-periodic motion?. Give any two examples, for each motion. **(Aug – 22)**
6. What is meant by force constant of a spring?
7. What is simple harmonic motion? **(May – 22)**
8. Mention the four different type of oscillations **(June – 23)**
9. Define time period of simple harmonic motion.
10. What is an epoch?.

PART – III

1. Explain resonance? Give an example. **(Mar – 20)**
2. Calculate the amplitude, angular frequency, frequency, time period and initial phase for the simple harmonic oscillation given equation $y = 0.3 \sin (40\pi t + 1.1)$ **(Oct – 20)**
3. Write short notes on two springs connected in series.
4. Write short notes on two springs connected in parallel.
5. State the laws of simple pendulum?. **(Aug – 22, Mar – 23)**
6. What is meant by periodic and non-periodic motion? Give any two examples for each motion **(May – 22)**

PART – IV

1. Explain the horizontal oscillations of a spring. **(Mar – 19, May - 22)**
2. Explain the oscillation of liquid column in U-tube. **(Aug – 21)**
3. Explain in detail the four type of oscillations **(July – 19, Mar - 20)**
4. What is meant by angular harmonic oscillation? Derive an expression for time period of angular harmonic oscillation. **(Oct – 20)**
5. Discuss in detail the energy in simple harmonic motion **(June -23)**
6. *Discuss the simple pendulum in detail.*
7. Describe the vertical oscillations of a spring.

11. Waves

PART – II

1. Write down the factors affecting velocity of sound in gases. **(Mar – 20)**
2. Compare the distance between anti-node and neighbouring node. **(Aug – 21)**
3. A mobile phone tower transmits a wave signal of frequency 900MHz. Calculate the length of the waves transmitted from the mobile phone tower.**(Aug – 22)**
4. Define wavelength.
5. Write down the relation between frequency, wavelength and velocity of a wave.
6. What is meant by interference of waves?.
7. Define intensity of sound and loudness of sound.
8. What is Doppler Effect ?
9. Explain red shift and blue shift in Doppler Effect.**(Oct – 20)**

PART – III

1. Explain any three applications of sound wave? **(July -19)**
2. Two waves of wavelength 99 cm and 100 cm both travelling with velocity of 396 ms^{-1} are made interfere. Calculate the number of beats produced by them per second.**(Mar – 19)**.
3. Write the difference between transverse and longitudinal waves**(Mar – 20)**
4. State the laws of transverse vibrations in stretched strings. **(Aug – 21, May -22)**
5. *Distinguish between progressive waves and stationary waves*

PART - IV

1. What are stationary waves?. Explain the characteristics of stationary waves. **(July – 19)**
2. How will you determine the velocity of sound using resonance air column apparatus? **(Mar – 19, June -23)**
3. What are stationary waves?. Explain the formation of stationary waves. **(Oct - 20)**
4. Explain how overtones are produced in a Closed organ pipe **(Aug – 21, May – 22, June -23)**
5. Describe Newton's formula for velocity of sound waves in air and also discuss the Laplace's correction. **(Mar – 23)**
6. Explain how overtones are produced in a Open organ pipe
7. What is a sonometer?. Give its construction and working. Explain how to determine the frequency of tuning fork using sonometer. **(Aug – 22)**

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