

**SWAMI VIVEKANANDA MATRIC HR SEC SCHOOL – ARUMBAVUR  
XI -PHYSICS PUBLIC EXAM EXPECTED QUESTIONS-2022  
2m, 3m & 5m QUESTIONS**

**UNT-1**

➤ **2 MARK:-III**

4. Write short notes on the following.

- a) Unit
- b) Rounding - off
- c) Dimensionless quantities

➤ **3MARK: - II**

2. How will you measure the diameter of the Moon using parallax method?

3. Write the rules for determining significant figures.

➤ **5MARK:-III**

1. ii) Write a note on triangulation method and radar method to measure larger distances.

2. Explain in detail the various types of errors.

3. What do you mean by propagation of errors? Explain the propagation of errors in addition and multiplication.

**UNIT-2**

➤ **2MARK:-II**

1. Explain what is meant by Cartesian coordinate system?

8. Define velocity and speed.

9. Define acceleration.

➤ **3MARK:-**

6. How do you deduce that two vectors are perpendicular? -II

10. What is the difference between velocity and average velocity. -II

4. Derive the equations of motion for a particle -III

(a) Falling vertically

(b) Projected vertically

➤ **5MARK:-III**

1. Explain in detail the triangle law of addition.

2. Discuss the properties of scalar and vector products.

3. Derive the kinematic equations of motion for constant acceleration.

**UNIT - 3**

➤ **2MARK:-II**

2. State Newton's second law.

3. Define one newton.

9. State Newton's third law.

11. Under what condition will a car skid on a leveled circular road?

➤ **3MARK:**

5. Using free body diagram, show that it is easy to pull an object than to push it. -II

6. Explain various types of friction. Suggest a few methods to reduce friction-**II**
9. Describe the method of measuring angle of repose –**III**
- **5MARK:-III**
3. Explain the motion of blocks connected by a string in
- i) Vertical motion
- ii) Horizontal motion.
4. Briefly explain the origin of friction. Show that in an inclined plane, angle of friction is equal to angle of repose.
11. Calculate the centripetal acceleration of Moon towards the Earth.

#### UNIT-4

- **2MARK:-II**
5. Define the following
- a) Coefficient of restitution
- b) Power
- c) Law of conservation of energy
- d) loss of kinetic energy in inelastic collision
- **3MARK:-II**
4. Explain the characteristics of elastic and inelastic collision.
- **5MARK:-III**
2. State and explain work energy principle. Mention any three examples for it.
4. Arrive at an expression for elastic collision in one dimension and discuss various cases.

#### UNIT-5

- **2MARK:-II**
1. Define Centre of mass.
3. Define torque and mention its unit.
5. Give any two examples of torque in day-to-day life.
9. Define couple.
10. State principle of moments.
- **3MARK:-II**
2. Find out the Centre of mass for the given geometrical structures.
- a) Equilateral triangle
- b) Cylinder
- c) Square
4. What are the conditions in which force cannot produce torque?
6. What is the relation between torque and angular momentum?
- **5MARK:-III**
3. Explain why a cyclist bends while negotiating a curve road? Arrive at the expression for angle of bending for a given velocity.
4. Derive the expression for moment of inertia of a rod about its Centre and perpendicular to the rod.
10. Discuss rolling on inclined plane and arrive at the expression for the acceleration.

#### UNIT-6

- **2MARK:-II**
5. What is meant by superposition of gravitational field?

6. Define gravitational potential energy.
8. Define gravitational potential.
11. Why is the energy of a satellite (or any other planet) negative?
13. Define weight.

➤ **3MARK:**

9. What is the difference between gravitational potential and gravitational potential energy? -II
12. What are geostationary and polar satellites? -II
12. Derive an expression for energy of satellite. -III

➤ **5MARK:-III**

4. Derive the expression for gravitational potential energy.
6. Explain in detail the idea of weightlessness using lift as an example.
7. Derive an expression for escape speed.
8. Explain the variation of  $g$  with latitude.
9. Explain the variation of  $g$  with altitude.

**UNIT-7**

➤ **2MARK:-II**

1. Define stress and strain.
2. State Hooke's law of elasticity.
3. Define Poisson's ratio.
5. Which one of these is more elastic, steel or rubber? Why?
13. Define coefficient of viscosity of a liquid.
15. What is Reynolds's number? Give its significance.
20. Two streamlines cannot cross each other. Why?

➤ **3MARK:**

8. Write down the expression for the elastic potential energy of a stretched wire. -II
14. Distinguish between streamlined flow and turbulent flow. -II
17. Write down the expression for the Stoke's force and explain the symbols involved in it. -II
7. Derive the expression for the terminal velocity of a sphere moving in a high viscous fluid using Stokes force. -III

➤ **5MARK-III**

1. State Hooke's law and verify it with the help of an experiment
8. Derive Poiseuille's formula for the volume of a liquid flowing per second through a pipe under streamlined flow.
10. What is capillarity? Obtain an expression for the surface tension of a liquid by capillary rise method.
11. Obtain an equation of continuity for a flow of fluid on the basis of conservation of mass.

**UNIT-8**

➤ **2MARK:-II**

9. State Stefan-Boltzmann law.

10. What is Wien's law?
12. What is a black body?
19. State Zeroth law of thermodynamics.
22. Define one calorie.
24. State the first law of thermodynamics.
29. What is PV diagram?
39. What is a cyclic process?
42. State Kelvin-Planck statement of second law of thermodynamics.
43. Define heat engine.

➤ **3MARK:**

32. Give an expression for work done in an isothermal process. - II
38. Draw the PV diagram for,-II
  - a. Isothermal process
  - b. Adiabatic process
  - c. isobaric process
  - d. Isochoric process.
22. Derive the expression for Carnot engine efficiency. - III

➤ **5MARK:-III**

7. Explain in detail Newton's law of cooling
12. Derive Mayer's relation for an ideal gas.
16. Derive the work done in an adiabatic process.
20. Explain the heat engine and obtain its efficiency.

**UNIT-9**

➤ **2MARK:-II**

3. Why moon has no atmosphere?
6. Define the term degrees of freedom.
7. State the law of equipartition of energy.

➤ **3MARK:**

5. What is the relation between the average kinetic energy and pressure?-II
6. Define the term degrees of freedom.-II
3. Explain in detail the kinetic interpretation of temperature.-III

➤ **5MARK:-III**

2. Derive the expression of pressure exerted by the gas on the walls of the container.
5. Derive the ratio of two specific heat capacities of monoatomic, diatomic and triatomic molecules.
7. Derive the expression for mean free path of the gas.

**UNIT-10**

➤ **2MARK:-II**

1. What is meant by periodic and non-periodic motion? Give any two examples, for each motion.
2. What is meant by force constant of a spring?

5. What is an epoch?
9. State the laws of simple pendulum?
- **3MARK-III**
2. Describe Simple Harmonic Motion as a projection of uniform circular motion.
8. Write short notes on the oscillations of liquid column in U-tube.
- **5MARK:-III**
5. Discuss the simple pendulum in detail.
7. Describe the vertical oscillations of a spring.
9. Discuss in detail the energy in simple harmonic motion.

### UNIT-11

- **2MARK:-II**
2. Write down the types of waves.
4. What are longitudinal waves?. Give one example.
6. Write down the relation between frequency, wavelength and velocity of a wave.
- **3MARK:-III**
12. What is a sonometer? Give its construction and working. Explain how to determine the frequency of tuning fork using sonometer.
16. What is meant by Doppler effect?
- Discuss the following cases
- (1) Source in motion and Observer at rest
- (a) Source moves towards observer
- (b) Source moves away from the observer
- **5MARK:-III**
3. Show that the velocity of a travelling wave produced in a string is  $v = \sqrt{\frac{T}{\mu}}$ .
4. Describe Newton's formula for velocity of sound waves in air and also discuss the Laplace's correction.
7. Explain how the interference of waves is formed.
14. Explain how overtones are produced in a
- (a) Closed organ pipe
- (b) Open organ pipe