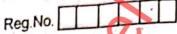
COMMON QUARTERLY EXAMINATION - 2024

Standard XI



PHYSICS

Time: 3.00 hrs

Marks: 70

- Choose the correct answer:
- Round of the following number 19.95 into three significant figures.
 - a) 19.9 1
- b) 20.0
- c) 20.1
- d) 19.5

- The dimensional formula of energy is
 - ML²T-2
- b) ML²T⁻³
- c) ML²T
- d) ML3T-2

- The dimension of $(\mu_o \varepsilon_o)^{-1/2}$ is
 - a) length b) time
- c) force
- d) velocity

- Identify the unit vector in the following
 - a) $\hat{i} + \hat{i}$

- If an object is thrown vertically up with the initial speed U from the ground, then the time taken by the object to return back to ground is

- Two objects of masses m_1 and m_2 fall from the heights h_1 and h_2 respectively. The 6. ratio of the magnitude of their moment a when they hit the ground is

- The centrifugal force appears to exist
 - a) only in inertial frames
- b) only in rotating frames
- c) in any accelerated frame
- defined) both in inertial and non-inertial frames
- 8. Two masses m_1 and m_2 are experiencing the same force where $m_1 < m_2$. The

ratio of their acceleration $\frac{a_1}{a_2}$ is

- a) 1
- c) less than 1

- b) greater than 1
- d) all the three cases

II. Answer any 6 questions. (Q.No.24 is compulsory)

- 16. Define precision and accuracy. Explain with one example.
- 17. Define one Newton.
- 18. What are the limitations of dimensional analysis?

XI Physics

- 19. Write down the kinematic equations for angular motion.
- 20. What is the condition for pure rolling?
- 21. State the empirical laws of static and kinetic friction.
- 22. Define coefficient of restitution.
- 23. How do you deduce that two vectors are perpendicular?
- 24. What are the resultants of the vector product of two given vectors is given by

 $\vec{A} = 4\hat{i} - 2\hat{j} + \hat{k}$ and $\vec{B} = 5\hat{i} + 3\hat{j} - 4\hat{k}$

Part - III

III. Answer any 6 questions. (Q.No.33 is compulsory)

 $6 \times 3 = 18$

- 25. State Kepler's three laws.
- 26. Prove that the path followed by the projectile s a parabola.
- 27. Discuss the properties of scalar products.
- 28. Using free body diagram, show that it is easy to pull an object than to push it.
- 29. Explain the similarities and differences of centripetal and centrifugal forces.
- 30. Arrive at an expression for power and velocity.
- 31. State and prove Parallel Axis Theorem.
- 32. Write the applications of Dimensional analysis.
- 33. 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 60 kg inside the car.

Part - IV

IV. Answerall the questions.

 $5 \times 5 = 25$

34. a) Derive the expression for moment of Inertia of a rod about its centre and perpendicular to the rod.

(OR)

b) State and explain work-energy principle.

Physics

35. a) Briefly explain the origin of friction. Show that in an inclined plane angle of friction is equal to angle of repose.

(OR)

- b) 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.
- 36. a) Explain in detail the triangle law of addition.

- b) What do you mean by propagation of error, Explain the propagation of errors in multiplication.
- 37. a) Discuss conservation of angular momentum with example.

(OR)

- b) Explain in detail the various types of errors.
- 38. a) Derive the kinematic equations of motion for constant acceleration.

(OR)

b) What is inelastic collision? In which way, it is different from elastic collision. Mention few examples in day-to-day life for inelastic collision.