**VIVEKANANDHA MAT HER SEC SCHOOL ~ UTHUKOTTAI**
**Quarterly Exam 2022** - **Model Question Paper**

CLASS : XI                                              TIME : 3 Hrs
SUBJECT : **PHYSICS**                          MARKS : 70
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PART - A

CHOOSE THE BEST ANSWER                            15 X 1 = 15

1.Th e velocity of a particle v at an instant t is given by $v = at + bt^2$ Th e dimensions
of b is
a) [L]      b) $[LT^{-1}]$    c) $[LT^{-2}]$      d) $[LT^{-3}]$

2 If the error in the measurement of radius is 2%, then the error in the determination of volume
of the sphere will be
a) 8%      b) 2%      c) 4%        d) 6%

3. 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
(a) $u^2/2g$    (b) $u^2/g$    (c) u/2g    (d) 2u/g

4. If a particle has negative velocity and negative acceleration, its speed
(a) increases (b) decreases (c) remains same (d) zero

5. A particle moves along the x-axis in such a way that its coordinates x varies with time 't'
according to the equation $x = 2 - 5t + 6t^2$ . What is the initial velocity of the particle?
(a) 5 ms$^{-1}$    (b) -5 ms$^{-1}$      (c) 6 ms$^{-1}$    (d) -6 ms$^{-1}$

6. Both Newton's first and second laws are valid only in
a)inertial frames   b) non-inerial frames   c) uniform motion   d) non-uniform motion

7. A vehicle is moving along the positive x direction, if sudden brake is applied, then
(a) frictional force acting on the vehicle is along negative x direction
(b) frictional force acting on the vehicle is along positive x direction
(c) no frictional force acts on the vehicle
(d) frictional force acts in downward direction

8. Force acting on the particle moving with constant speed is
(a) always zero   (b) need not be zero   (c) always non zero   (d) cannot be concluded

9. If the linear momentum of the object is increased by 0.1%, then the kinetic energy is
increased by
(a) 0.1 %    (b) 0.2%    (c) 0.4%    (d) 0.01%

10. A spring of force constant k is cut into two pieces such that one piece is double the length of
the other. Then, the long piece will have a force constant of
(a) ⅔ k    (b) 3/2 k        (c) 3 k      (d) 6 k

11.A couple produces,
(a) pure rotation    (b) pure translation   (c) rotation and translation   (d) no motion

12.A round object of mass M and radius R rolls down without slipping along an inclined plane.
The fractional force,
(a) dissipates kinetic energy as heat. (b) decreases the rotational motion.

(c) decreases the rotational and transnational motion (d) converts transnational energy into Irotational energy

13. Th e center of gravity of an extended body is that point where the total gravitational torque on the body is

(a) Positive      (b) Negative      (c) zero      (d) non zero

14. If a person moves from  Trichy to chennai, his weight

(a) increases   (b) decreases    (c) remains same     (d) increases and then decreases

15. If the distance between the Earth and Sun were to be doubled from its present value, the number of days in a year would be

(a) 64.5    (b) 1032     (c) 182.5    (d) 730

## PART – B

ANSWER ANY SIX QUESTIONS. (Q.NO 24 IS COMPULSORY )                          6 X 2 = 12

16. Define precision and accuracy

17. How do you deduce that two vectors are perpendicular?

18. What is non uniform circular motion?

19. If two objects of masses 2.5 kg and 100 kg experience the same force 5 N, what is the acceleration experienced by each of them?

20. When walking on ice one should take short steps. Why?

21. Give any two examples of torque in day-to-day life.

22. Mention any two physical significance of moment of inertia

23. Define gravitational potential.

24. Water in a bucket tied with rope is whirled around in a vertical circle of radius 0.5 m. Calculate the minimum velocity at the lowest point so that the water does not spill from it in the course of motion. (g = 10 ms$^{-2}$)

## PART - C

ANSWER ANY SIX QUESTIONS.Q.NO 31 IS COMPULSORY.                          6X 3 = 18

25. Write a note on triangulation method

26. A train was moving at the rate of 54 km h$^{-1}$ when brakes were applied. It came to rest within a distance of 225 m. Calculate the retardation produced in the train

27. Derive the expression for centripetal acceleration.

28 . What are concurrent forces? State Lami's theorem.

29 .Write the various types of potential energy. Explain the formulae

30. Arrive at an expression for power and velocity. Give some examples for the same.

31. A force of  (4i -3j +5k)  N is applied at a point whose position vector is ( 7i+ 4j -2k)   m. Find the torque of force about the origin.

32. State and prove perpendicular axis theorem.

33. Discuss the important features of the law of gravitation.

## PART - D

ANSWER ALL THE QUESTIONS.                                              5 X 5= 25

34. What do you mean by propagation of errors? Explain the propagation of errors in addition and multiplication (OR) Explain the principle of homogeniety of dimensions. What are its uses? Give example

35. Discuss the properties of scalar. (OR) Derive the kinematic equations of motion for constant acceleration.

36. Explain the need for banking of tracks (OR) 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.

37. State and explain work energy principle. Mention any three examples for it.(OR) Explain the variation of g with depth from the Earth's surface.

38. Explain the method to find the center of gravity of a irregularly shaped lamina. (OR) Derive the expression for moment of inertia of a rod about its center and perpendicular to the rod

—-------------- All The Best —--------

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