www.Padasalai.Net - No.1 Educational Website in Tamilnadu

11105

No. of Printed Pages: 4

Register Number

11

REVISION EXAMINATION

PART – III
PHYSICS

Time Allowed : 3.00 Hours] [Maximum Marks : 70

Instructions :
(1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
(2) Use **Blue** or **Black** ink to write and underline and pencil to draw diagrams.

PART – I

Note : (i) Answer **all** the questions. 15x1=15
(ii) Choose the most appropriate answer from the given **four** alternatives and write the option code and the corresponding answer.

1. If the masses and mutual distance between the two objects are doubled, the gravitational force between them will
(a) No change (b) Increase 2 times (c) Increase 4 times (d) Decreases 2 times

2. A screw gauge gives the following readings when used to measure the diameter of a Wire Main scale reading: 0 mm, Circular scale reading: 52 divisions. Given that 1 mm on main scale corresponds to 100 divisions on the circular scale. The diameter of the wire from the above data is
(a) 0.052 cm (b) 0.52 cm (c) 0.026 cm (d) 0.26 cm

3. The work done by the Sun's gravitational force on the Earth is
(a) always zero (b) always positive
(c) can be positive or negative (d) always negative

4. If a person moves from Chennai to Trichy, his weight
(a) increases (b) decreases
(c) remains same (d) increases and then decreases

5. A rigid body rotates with an angular momentum L. If its kinetic energy is halved, the angular momentum becomes,
(a) L (b) $\frac{L}{2}$ (c) 2L (d) $\frac{L}{\sqrt{2}}$

6. Identify the unit vector in the following
(a) $\hat{\imath} + \hat{\jmath}$ (b) $\frac{\hat{\imath}}{\sqrt{2}}$ (c) $\hat{k} - \frac{\hat{\imath}}{\sqrt{2}}$ (d) $\frac{\hat{\imath}+\hat{\jmath}}{\sqrt{2}}$

[Turn Over

Kindly send me your questions and answerkeys to us : Padasalai.Net@gmail.com

www.Padasalai.Net - No.1 Educational Website in Tamilnadu

7. From a disc of radius R a mass M, a circular hole of diameter R, whose rim passes through the centre is cut. What is the moment of inertia of the remaining part of the disc about a perpendicular axis passing through it

(a) $\frac{15\ MR^2}{32}$ (b) $\frac{13\ MR^2}{32}$ (c) $\frac{11\ MR^2}{32}$ (d) $\frac{9\ MR^2}{32}$

8. A rope is wound around a hollow cylinder of mass 3 kg and radius 40 cm. What is the angular acceleration of the cylinder if the rope is pulled with a force 30 N?

(a) 0.25 rad s^{-2} (b) 25 rad s^{-2} (c) 5 m s s^{-2} (d) 25 ms^{-2} .

9. A screw gauge has least count of 0.01 mm and there are 50 divisions in its circular scale.The pitch of the screw gauge is :

(a) 0.25 mm (b) 0.5 mm (c) 1.0 mm (d) 0.01 mm

10. 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%

11. Which of the following pairs of physical quantities have same dimension?

(a) Work and Energy (b) force and power

(c) torque and power (d) force and torque

12. If a particle executes uniform circular motion in the xy plane in clock wise direction, then the angular velocity is in

(a) +y direction (b) +z direction (c) -z direction (d) -x direction

13. Two equal masses m_1 and m_2 are moving along the same straight line with velocities 5ms^{-1} and -9ms^{-1} respectively. If the collision is elastic, then calculate the velocities after the collision of m_1 and m_2, respectively

(a) -4ms^{-1} and 10 ms^{-1} (b) 10ms^{-1} and 0 ms^{-1}

(c) -9ms^{-1} and 5 ms^{-1} (d) 5 ms^{-1} and 1 ms^{-1}

14. An object is dropped in an unknown planet from height 50 m, it reaches the ground in 2 s . The acceleration due to gravity in this unknown planet is

(a) g = 20 m s^{-2} (b) g = 25 m s^{-2} (c) g = 15 m s^{-2} (d) g = 30 m s^{-2}

15. If the potential energy of the particle is $\alpha - \frac{\beta}{2}x^2$, then force experienced by the particle is

(a) F = $\frac{\beta}{2}x^2$ (b) F = βx (c) F = $-\beta x$ (d) F = $-\frac{\beta}{2}x^2$

PHYSICS SRMHSS,TIRUMALAI

Kindly send me your questions and answerkeys to us : Padasalai.Net@gmail.com

www.Padasalai.Net - No.1 Educational Website in Tamilnadu

PART – II

Note : Answer **any six** questions. Question No. **24** is **compulsory.** 6x2=12

16. What are geostationary and polar satellites?
17. Give any two examples of torque in day-to-day life.
18. Write the significance of kinetic energy in the work-kinetic energy theorem.
19. Two masses m_1 = 5 kg and m_2 = 4 kg tied to a string are hanging over a light frictionless pulley. What is the acceleration of each mass when left free to move? (g=10ms^{-2})
20. Write the assumptions need to study about the projectile motion.
21. Define precision and accuracy.
22. Explain what is meant by Cartesian coordinate system.
23. Define Couple.
24. A gun fires 8 bullets per second into a target X. If the mass of each bullet is 3 g and its speed 600 ms^{-1}, then calculate the power delivered by the bullets.

PART – III

Note : Answer **any six** questions. Question No**. 33** is **compulsory.** 6x3=18

25. Two identical water bottles, one empty and the other filled with water are allowed to roll down an inclined plane. Which one of them reaches the bottom first?
26. What is free body diagram? What are the steps to be followed for developing free body diagram?
27. An object is thrown with initial speed 5ms^{-1} with an angle of projection 30^0.Calculate the maximum height reached and the horizontal range.
28. Arrive at Einstein's mass-energy relation by dimensional method (E = mc^2).
29. Write about dimensional variables and dimensionless variable with an example.
30. Explain the concept of inertia. Write two examples each for inertia of motion, inertia of rest and inertia of direction.
31. A force of $(4\hat{\imath} - 3\hat{\jmath} + 5\hat{k})$ 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 the origin.
32. Obtain a relation between momentum and kinetic energy.
33. Suppose we go 200 km above and below the surface of the Earth, what are the g values at these two points? In which case, is the value of g small?

[Turn Over

PHYSICS, SRMHSS, TVMALAI
www.Padasalai.Net

Kindly send me your questions and answerkeys to us : Padasalai.Net@gmail.com

www.Padasalai.Net - No.1 Educational Website in Tamilnadu

PART – IV

Note : Answer **all** the questions. 5x5=25

34. Using a Vernier Callipers, the length of a cylinder in different measurements is found to be 2.36 cm, 2.27 cm, 2.26 cm, 2.28 cm, 2.31 cm, 2.28 cm and 2.29 cm. Find the mean value, absolute error, the relative error and the percentage error of the cylinder.

(OR)

What is elastic Collison? Derive an expression for final velocities of two bodies which undergo elastic collision in one dimension.

35. (i) Write down the equation of a freely falling body under gravity.

(ii) A ball is thrown vertically upwards with speed of 19.6 ms^{-1} from the top of a building and reaches the earth in 6s. Find the height of the building.

(OR)

Briefly explain what are all the forces act on a moving vehicle on a leveled circular road?

36. Two bodies of masses 60 kg and 30 kg moving in the same direction along straight line with velocity 40cms^{-1} and 30cms^{-1} respectively suffer one dimensional elastic collision. Find their velocities after collision.

(OR)

(i) Derive the expression for the variation of acceleration due to gravity (g) with depth from the surface of the earth(d).

(ii) Find the ratio of the acceleration due to gravity at a height R/2 from the surface of the earth to the value at a depth R/2 from the surface of the earth (R – radius of the earth)

3.7. Discuss rolling on inclined plane and arrive at the expression for the acceleration.

(OR)

Write an expression for the kinetic energy of a body in pure rolling.

38. Derive the linear kinematic equations of motion for constant accelerated motion.

(OR)

(i) What are the applications of dimensional analysis?

(ii) Express 76 cm of mercury pressure in terms of Nm^{-2} using the method of dimensions.

- 0 0 0 -

RAJENDRAN M, M.Sc., B.Ed., C.C.A., P.G. TEACHER IN PHYSICS,
SRMHSS, KAVERIYAMPOONDI, TIRUVANNAMALAI – 606603.

Kindly send me your questions and answerkeys to us : Padasalai.Net@gmail.com