**Pratice Paper3**

**Class – XI**

**Subject – Physics**

**Time: 3 Hrs MM: 70**

**General Instructions:**

All questions are compulsory.

There are 26 questions in total. Questions 1 to 5 carry 1 mark each, questions 6 to 10 carry 2 marks each, question11to 22 carry 3 marks each and question 23 carry 4 marks, questions 24 to 26 carry 5 marks each.

There is no overall choice.

Use of calculators is not permitted.

You may use the following physical constants wherever necessary.

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. You may use the following values of physical constants wherever necessary:

c = 3 x 108 ms–1

h = 6.626 x 10–34 Js

e = 1.602 x 10–19 C

μ0 = 4 π x 10–7 T m A–1

Mass of neutron mn ≅ 1.675 x 10–27 kg

Boltzmann’s constant k = 1.381 x 10–23 J K–1

Avogadro’s number NA = 6.022 x 1023 / mol –1

1. Why we use a platinum iridium alloy in making prototype meter and

kilogram?

2. Define coefficient of restitution or coefficient of resilience.

3. Radius of gyration is a constant quantity.

4. Why is ploughing of fields essential?

5. How does internal energy of gas changes in an adiabatic process?

6. Give two examples of intensive variables.

7. The length of the rod as measured in an experiment was found to be 3.23

m, 3.25 m, 3.27 m, 3.22. Find the absolute error.

8. There is a bug who moves from point A to point B and then finally to C in

5 seconds. Are the speed and velocity of the bug different?

9. Explain that gravitational force is a conservative force.

10. Name a polar satellite. State its uses.

11. Smoothening of surface beyond the limit increases the friction. Why? What is Magnus effect?

12. If the kinetic energy of one mole of an ideal gas is E=3/2 RT, what will be

its Cp?

13. If a body A of mass ‘M’ is thrown with velocity u at an angle 300 with the

horizontal and another body B is of the same mass be projected with the

same velocity at angle 600 to the horizontal, then prove that the ratio of

horizontal ranges will be 1:1 and that of maximum height will be 1:3**.**

14. Calculate the recoil velocity V of the gun of mass M when a bullet of mass

m is fired with a horizontal velocity v.

15. Derive equation for loss of kinetic energy in case of a completely inelastic

collision in one dimension?

16. Consider two bodies X and Y with mass m1 and m2 separated by distance

‘r’ meters. Suppose mass of X is doubled and mass of Y is tripled also thedistance between them is doubled. Find the ratio of the gravitational force

before and after changing the masses and distance.

17. A circular track of radius 100 m is banked at an angle of 30°. If the

coefficient of friction between the wheels of a car and the road is 0.5, then

what is the (i) optimum speed of the car to avoid wear and tear on its tires,

and (ii) maximum permissible speed to avoid slipping?

18. What are thermal radiations? Give some of its basic characteristics.

19. State the law of equipartition of energy. Show that the ratio of specific

heat at constant pressure to specific heat at constant volume is 7/5 for a

rigid diatomic molecule.

21. State and prove Work-energy theorem.

22**.** Explain why

(i) a body with large reflectivity is a poor emitter

(ii) heating systems based on circulation of steam are more efficient in

warming a building than those based on circulation of hot water.

23. What is a Carnot’s engine? What is its efficiency?

24**.** What is a projectile? Derive the expressions for the time of flight, and

maximum height for the projectile thrown upwards at an angle θ with the

horizontal direction.

The ceiling of a long hall is 25 m high. What is the maximum horizontal

distance that a ball thrown with a speed of 40 m s–1 can go without hitting

the ceiling of the hall?

25. What is S.H.M..

A particle executes SHM according to the equation

*x* *A*cosw*t*.

Draw graphs to represent the displacement, velocity and acceleration of the

particle.

OR

 Differentiate between particle velocity and wave velocity**.**

A sound wave traveling along a string is described by

*y* 5103 sin 80*x* 3*t* .

Calculate

(i) the amplitude

(ii) the wavelength

(iii) frequency of the wave.

26. State and prove Bernouilli theorm**.**

OR

Discuss motion in vertical circle.