W–1–B

Roll No.....

Total No. of Questions : **26**]

[*Total No. of Printed Pages* : **4**

XIAP/BIKD22
7101–B
PHYSICS

Time : 3 Hours] **[Maximum Marks : 70**

(Very Very Short Answer Type Questions) 1 each

1. Find :

$$\frac{dy}{dx}$$

if $x = at^2$ and $y = 2at$.

2. What do you mean by the term Accuracy ?

3. Why a gun recoils back when it is being fired ?

4. At what temperature, gas loses all its energy ?

5. At what point in its trajectory does a projectile has minimum speed ?

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(Very Short Answer Type Questions)

6. Convert 10 Newton into dyne using dimensional analysis.

7. Define dimensions and dimensional formula.

8. Derive $v = u + at$ using Calculus.

9. Define the term strain. What are the various types of strain ?

10. State streamline flow and turbulent flow.

(Short Answer Type Questions)

11. State Newton's 2nd law of motion. Prove that :

$$\vec{F} = m\vec{a}$$

where the symbols have their usual meanings.

12. Explain any *three* methods of reducing friction.

13. Differentiate e^{ax} by ab-initio method.

14. Derive an expression for potential energy of a body.

15. What are elastic and inelastic collisions ?

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16. ...wo theorems of moment of inertia.

17. Derive the relation between torque and moment of inertia of a body.

18. What is Gravitational Potential Energy ? Derive an expression for it.

19. The acceleration due to gravity at a depth '*d*' reduces to 25% from the value at the surface. Calculate the value of '*d*' if radius of earth is 6400 km.

20. Show that surface tension is numerically equal to the surface energy.

21. What are the limitations of First Law of Thermodynamics ?

22. Define reversible and irreversible processes with at least one example each.

(Value Based Questions)

23. What do you mean by relative velocity ? Show that when two trains move in the opposite directions, then one train appear to move faster than its actual speed of the other train.

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W–1–B

Total No. of Qu

XI

(Long Answer Type Questions)

24. Derive an expression for pressure exerted by an Ideal gas.

Or

What do you understand by degrees of freedom ? Give a general relation to find degrees of freedom. Find degrees of triatomic gases.

25. Distinguish between periodic and oscillatory motion. Give *two* examples in each case.

Or

What is a Simple Pendulum ? Derive an expression for time period of a simple pendulum.

26. What are Beats ? Explain the formation of beats analytically.

Or

State and explain principle of superposition of waves. Name the phenomenon explained by this principle.

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