SAINIK SCHOOL AMBIKAPUR
HOLIDAY HOMEWORK: 2025-26
SUBJECT: PHYSICS
<u>CLASS: XI</u>

Important Instructions
➢ The homework has to write in separate '<u>A4 **rule pages'**</u> and the front page must be decorated. Please don't write it in your note **book**.
➢ No stick file is required. It should be stapled only.
➢ The class work must be completed in your class note book.

S.No	HOMEWORK
1	The acceleration of a particle moving in straight line is given as: $a = 8t - 5t^2$. What is the velocity and displacement of the body at t=3s?
2	A particle moves along a straight line such that its displacement's' at any time't' is given by $s = (t^3 - 6t^2 + 3t + 4)$ m. Find the velocity and acceleration at t =2s.
3	The displacement of a particle along x-axis is given by $x = 4 + 8t + 14t^2$. Obtain its velocity and acceleration.
4	A body starting from rest has an acceleration of 20 m/s^2. Calculate the distance travelled by it in 10th second.
5	State and prove parallelogram law of vector addition.
6	State triangle law of vector addition. Give any two real life examples.
7	State the number of significant figures in the following: (a) 0.007 m^2 (b) 2.64 x 10^4 kg (c) 0.2370 g cm^{-3} (d) 6.320 J (e) 6.032 N m^{-2} (f) 0.0006032 m^2
8	'The length, breadth and thickness of a rectangular sheet of metal are 4.234 m, 1.005 m and 2.01 cm respectively. Give the area and volume of the sheet to correct significant figures.
9	Draw the Y vs X graphs : **(a)** $y = Ax^2$ (b) $y = Ax + B$ (c) $x = y^2$ (d) $y = Ax$ (e) $y = A \sin(5x^4)$ (f) $y = A \cos(3x)$
10	A car moving along a straight highway with speed of 126 km h^{-1} is brought to a stop within a distance of 200 m. What is the retardation of the car (assumed uniform), and how long does it take for the car to stop?
11	A ball is dropped from a height of 90 m on a floor. At each collision with the floor, the ball loses one tenth of its speed. Plot the speed-time graph of its motion between t =0 to 12 s.
12	Find the **differentiation** of following functions : (a) $y = 2x^5$ (b) $y = 5x^{-7}$ (c) $y = 3x^5 + 7x^{-8}$ (d) $y = e^x \cdot e^{-x}$

	(e) y = Cos(x) .Sin(x) (e) y = $9e^{2x} - 11 e^{-3x}$

13	Find the **integration** of following functions :
	    (a) I = $\int x^3 \, dx$
	    (b) I = $\int x^{-5} \, dx$
	    (c) I = $\int \sin(3x) \, dx$
	    (d) I = $\int e^{2x} \, dx$
	    (e) I = $\int \cos(5x) \, dx$

14	Derive the dimensional formula of the following physical quantities:
	    (a) Time period (T) of a simple pendulum having length (l) moving under gravity with acceleration (g).
	    (b) Gravitational Force (F) acting between two masses separated by a distance R.

15	If A = 3i +6j + 9k ; B =6i -2j-7k ; C = 4i+5j-7k ; Than find the following : (a) A + B (b) A - B (c) A.B (d) A x B (e) A.(B x C)

16	If a vector A = 2i-4j +5k is given.
	    (a) Find the magnitude of A.
	    (b) Find the Unit vector of A.
	    (c) Also find the unit vector of a vector parallel to A vector.

17	Derive the three equations of motion with the help of graphical method.
18.	If $(P + a/V^2)(V - b)$ = Constant ; find the dimension of 'a' and 'b'. Also write their S.I units.
19	Check LHS and RHS ; whether they are dimensionally equal or not: (a) F.s = ½ m($V_f^2 - V_i^2$) (b) $v^2 - u^2 = 2aS$ (c) mg = Gm_1m_2/r^2
20	Write down the five difference between Dot product and Cross product.