NEW STANDARD ACADEMY

Semri Kothi Super Market, Raebareli
CLASS 11 DPP (Academy) 30-06-2025

PHYSICS

1. A constant retarding force of 50 N is applied to a body of mass 20 kg moving with a speed of 15 m/s. How long does the body take to stop?

2. Match column I with column II

	Column I		Column II
(a)	Passenger bent forward when suddenly bus stops	(i)	Action-reaction
(b)	Detachment of particle from cloth on striking by rod	(ii)	Inertia of motion
(c)	Detachment of mud particles from wheel	(iii)	Inertia of rest
(d)	Walking on ground surface	(iv)	Inertia of direction

3. A constant force acting on a body of mass 3 kg changes its speed from 2 m/s to 3.5 m/s in 25 second. The direction of motion of the body remains unchanged. What is the magnitude and direction of the force?

4. A body of mass 5 kg is acted upon by two perpendicular forces 8 N and 6 N. Give the magnitude and direction of the acceleration of the body.

5. Two masses 8 kg and 12 kg are connected at the two ends of a light inextensible string that goes over a frictionless pulley. Find the acceleration of the masses and the tension in the string when the masses are released.

6. Match column I with column II

	Column I		Column II
(a)	Force applied to an object	(i)	Newton's third law of motion
(b)	Impulse	(ii)	Rate of change of momentum
(c)	Inertia of an object	(iii)	Newton's first law of motion
(d)	Action and reaction forces	(iv)	Total change in momentum

7. A nucleus is at rest in the laboratory frame of reference. Show that if it disintegrates into two similar nuclei, the products must move in opposite directions.

8. Match column I with column II

	Column I		Column II
(a)	Angle between centripetal force and velocity	(i)	Angle = 0°
(b)	Angle between velocity and acceleration	(ii)	0° ≤ Angle < 90°
(c)	Angle between acceleration and centripetal acceleration	(iii)	0° < Angle < 180°
(d)	Angle between tangential acceleration and velocity	(iv)	Angle = 90°

9. Two billiard balls each of mass 0.05 kg moving in opposite direction with speed 6 m/s collide and rebound with the same speed. What is the impulse imparted to each ball due to the other?

10. Match column I with column II

	Column I		Column II
(a)	Newton's second law	(i)	$\int \vec{F} dt$
(b)	Impulse	(ii)	$\vec{F}_{12} = -\vec{F}_{21}$
(c)	Net force	(iii)	$m\vec{a}$
(d)	Newton's third law	(iv)	$\vec{F} = \dfrac{d\vec{P}}{dt}$

CHEMISTRY

1. Energy of an electron in the ground state of the hydrogen atom is $- 2.18 \times 10^{-18}$ J. Calculate the ionisation enthalpy of atomic hydrogen in terms of J/mol.

2. Among the second period elements, the actual ionisation enthalpies are in the order:

$$Li < B < Be < C < O < N < F < Ne$$
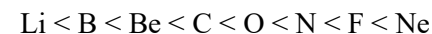
Explain why:
(a) Be has higher $\Delta_i H$ than B
(b) O has lower $\Delta_i H$ than N and F?

3. What are the various factors due to which the ionisation enthalpy of the main group elements tends to decrease down the group?

4. The first ionisation enthalpy values (in kJ/mol) of group 13 elements are:

B	Al	Ga	In	T1
801	577	579	558	589

How would you explain this deviation from the general trend ?

5. Would you expect the second electron gain enthalpy of O as +ve, more ve or less -ve than the first ? Justify your answer.

6. Use the periodic table to answer the following questions:
   (a) Identify an element with-5 electrons in the outer sub-shell.
   (b) Identify an element that would tend to lose two electrons.
   (c) Identify an element that would tend to gain two electrons.
   (d) Identify the group having metal, non-metal, liquid as well as gas at the room temperature.

7. Would you expect the first ionisation enthalpies for two isotopes of the same element to be the same or different? Justify your answer.

8. What are the major differences between metals and non-metals ?

9. Considering the elements B, Al, Mg and K, the correct order of their metallic character is:

10. Considering the elements F, Cl, O and N, the correct order of their chemical reactivity in terms of oxidising property is

3. Prove that $\tan\left(\frac{\pi}{4} + x\right) + \tan\left(\frac{\pi}{4} - x\right) = 2\sec 2x$

4. Show that $2\sin^2\beta + 4\cos(\alpha + \beta)\sin\alpha \sin\beta + \cos 2(\alpha + \beta) = \cos 2\alpha$

5. Find the value of : $\cos^4\frac{\pi}{8} + \cos^4\frac{3\pi}{8} + \cos^4\frac{5\pi}{8} + \cos^4\frac{7\pi}{8}$.

6. If $\tan\frac{x}{2} = \frac{m}{n}$ Prove that $m\sin x + n\cos x = n$.

7. Find the value of $\tan\frac{\pi}{8}$.

8. If $\sin x + \sin y = a$ and $\cos x + \cos y = b$, find
   (i) $\sin(x+y)$ (ii) $\cos(x-y)$

9. Find the range of the function $f(x) = \sin^4 x + \cos^4 x + 1$.

10. If $\sin x = \frac{3}{5}$ and $0 < x < \frac{\pi}{2}$, find the value of
    (i) $\sin 2x$ (ii) $\cos 2x$

BIOLOGY

1. What is a perigynous flower give an example
2. What is epipetlouss condition in stamen
3. What is an actinomorphic flower give the example
4. What is zygomorphic flower give the example
5. What is inflorescence
6. Give the differences between Racemose and cymose inflorescence with example
7. Define hypogynous flower with example
8. Draw labell diagram of apical part of root
9. What is the phyllotaxy
10. Give the difference between simple and compound leaf

MATHS

1. Prove that $\frac{\sin x - \sin 3x}{\sin^2 x - \cos^2 x} = 2\sin x$

2. Prove that $\tan 4x = \frac{4\tan x(1 - \tan^2 x)}{1 - 6\tan^2 x + \tan^4 x}$