NEW STANDARD ACADEMY

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CLASS 11 (Academy) 28-04-2025

PHYSICS

1. 1. Calculate the dimensions of the following quantities:
   (a)Volume   (b)Speed   (c)Acceleration   (d)Density
2. Pick out the units that have a different dimension to the other three:
   (a) $kg\ m^2\ s^{-2}$ (b)$g\ mm^2\ s^{-2}$ (c) $kg^2\ m\ s^{-2}$ (d) $mgcm^2\ s^{-2}$
3. Considering X and Y as Measures of distances find the dimensional formula of k in $y = x + \frac{1}{2}kx^3$
4. Hooke's law states that the force, F, in a spring extended by a length x is given by $F = -kx$. From Newton's second law $F = ma$, where m is the mass and a is the acceleration, choose the dimension of the spring constant k:
   (a)MT^{-2} (b)MT^2 (c)$ML^{-2}T^{-2}$ (d)ML^2T^2
5. Check that the dimensions of each side of the equations below agree:
   (a)The volume V of a cylinder of radius r and height h: $V = \pi r^2 h$.
   (b) $v = u + at$ for an object with initial speed u, (constant) acceleration a and final speed v after a time t.

CHEMISTRY

1. In three moles of ethane (C_2H_6) calculate: (i) Number of moles of carbon atoms (ii) Number of moles of hydrogen atoms (iii) Number of molecules of ethane.
2. How many atoms of Na, C and O are present in 0.5 mole of Na_2CO_3?
3. How many mole are there in $1m^3$ of any gas at N.T.P.?
4. If a mole were to contain 1×10^{24} particles, what would be the mass of a single molecule of O_2?
5. A glucose solution contains 9 g of glucose ($C_6H_{12}O_6$) How many atoms of C, H and O are present in it?

BIOLOGY

1. What is the significance of vacuole in a plant cell?
2. What does 'S' refer in a 70S & an 80S ribosome?
3. Mention a single membrane bound organelle which is rich in hydrolytic enzymes.
4. What are gas vacuoles? State their functions?
5. What is the function of a polysome?
6. What is the feature of a metacentric chromosome?
7. What is refered to as satellite chromosome?
8. Discuss briefly the role of nucleolus in the cells actively involved in protein synthesis.
9. Explain the association of carbohydrate to the plasma membrane and its significance.
10. Comment on the cartwheel structure of centriole.

MATH

1. Solve $2(2x + 3) - 10 \le 6(x - 2)$ for real x
2. Solve $x + \frac{x}{2} + \frac{x}{3} < 11$ for real x
3. Solve the inequality $2x + 3y \le 6$ graphically
4. Solve the inequality $2x - 3y > 6$ graphically
5. If $x \in [-1,5]$ the $x^2 \in$
6. Solve $\sqrt{\frac{(x-2)(x-7)}{(x-5)}}$
7. Solve $x^2 - 5|x| + 6 = 0$
8. $(2^x - 1)(3^x - 27)(4^x - 64) > 0$
9. Which of the following does not satisfy $\frac{(2x-1)(x+1(x-2)^2}{(x+3)(x-4)^3} > 0$?
10. . Sum of roots the equation $\left|\frac{x+2}{x-1}\right| = 2$ is