NEW STANDARD ACADEMY

SEMRI KOTHI SUPER MARKET, RAEBARELI

CLASS 11 (CHEMISTRY) DPP (Academy) 01/07/2024

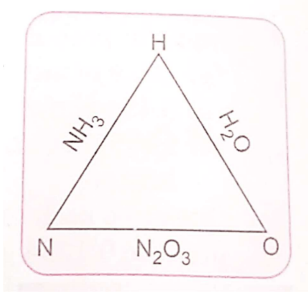
1. The dimensions of a gold bar are $4in \times 6in \times 9\ in$. The density of gold is 19.3g/cm^3.Calcilate the weight of gold bar in pounds.
2. A family consumes 2L of milk daily. Calculate the volume of milk consumed in 30 days in Si units.
3. 216.59 gram mercuric oxide gives 200.59 g mercury and 16 g oxygen. Show that it confirms the law of conservation of mass.
4. When 4.2 g $NaHCO_3$ reacts with 10g acetic acid, CO_2 formed is 2.2 g and mass of solution is 12 g. Show that these data confirm the law of conservation of mass.
5. 4.88 gram $KClO_3$ on heating gives 1.92 g O_2. What is the weight of KCI (residue) left?

   Hint : $2\ KClO_3 \longrightarrow 2\ KCl + 3\ O_2$ (4.88 g; x; 1.92 g)
6. 0.65 g of Zn was put in a solution of 1.5 g $CuSO_4$ and the Cu thus precipitated weighed 0.635 g. What weight of zinc sulphate will be recovered on evaporation of the remaining solution.
7. 3.4 g of $AgNO_3$ in 100 g water, when mixed with 1.17 g of NaCl in 100 g water, 2.87 g of AgCl and 1.70 g $NaNO_3$ were obtained. Justify that the data proves law of conservation of mass.
8. What weight of Barium chloride will react with 2.36 g of sodium sulphate to produce 3.88 g of barium sulphate and 1.94 g of sodium chloride in solution?
9. 0.5 gram silver is dissolved in excess of nitric acid. This solution is treated with excess of NaCl solution when 0.66 g AgCl is fromed. One gram metallic silver wire is headed in heated in dry Cl_2.1.32 g AgCl is fromed. Show that these data confirm the law of constant proportion.
10. 1.4 g calcium oxide contains 0.4 g oxygen, 3.5 g calcium oxide contains 2.5 g calcium. Show that these data confirm the law of constant composition.
11. (a) 1.75 g copper gives 2.19 g copper oxide
    (b) 1.135 g copper gives 1.430 g copper oxide. Show that these data confirm the law of definite proportion.
12. Weight of copper oxide obtained by treating 2.16 g of metallic copper with nitric acid followed by ignition was found to be 2.7 g. In another experiment 1.15 g of copper oxide on reduction gave 0.92 g of copper. Prove that the results confirm the law of definite proportions. [Ans Cu = 80% , O = 20%]
13. A pure sample of limestone was found to contain 40% calcium, 12% carbon and 48% oxygen. Following the law of definite proportions, find out the weight of calcium, carbon and oxygen in 5.00 g of another sample of pure limestone.
14. An element forms two oxides. In one oxide, one gram of the oxide contains 0.5 g of the element. In another axide, 4 g of the oxide contains 0.8 g of the element. Show that these data confirm the law of multiple proportion.
15. Two oxides of carbon contain 57.2% and 72.73% oxygen. Show that these data confirm the law of multiple proportions.
16. 1gram of two oxides of a metal are reduced by H2- Metal formed weigh 0.888g and 0.799g. Show that these data illustrate the law of multiple proportions.
17. Show that the following data confirm the law of multiple proportions:
    (a) 1.77 g of metal oxide gives 1.61 g metal on heating.
    (b) 3.45g of metal oxide gives 3.21g metal on heating.
    (c) 1.195g of metal oxide gives 1.04g metal on heating.
18. One gram each of two oxides on reduction with H_2 gas produce 0.1254 g and 0.2263 g water. Prove that these values confirm the law of multiple proportions.
19. Sulphur forms two oxides having 50% and 60% oxygen by mass respectively. Prove that these results illustrate the law of multiple proportion.
20. Hydrogen and oxygen are known to form two compounds. The hydrogen contents of the two compounds are 42.9% and 27.3% respectively. Show that this data is in agreement with law of multiple proportions.
21. Elements X and Y combine to form three different compounds:
    (i) 0.3 g of X combines with 0.4 g of Y to form 0.7 g of compound A.
    (ii) 18 g of X combines with 48 g of Y to form 66 g of compound B.

(iii) 40 g of X combines with 159.99 g of B to form 199.99 g of compound C.

Show that the data illustrates the law of multiple proportions.

22. Tin forms two oxides. The % of tin in the two oxides is 78.77 and 88.12. Show that these data confirm the law of multiple proportion.
23. % of H in the three hydrocarbons is 7.7, 14.3 and 25. Show that these data illustrate the law of multiple proportion.
24. An element forms two oxides. 2 gram of each axide on heating with H_2 gives 0.2517 g and 0.4526 g water. Show that these data confirm the law of multiple proportion
25. A metal forms two oxides. % of metal in them is 72.4 and 70. If first oxide is M_3O_4 what is the formula of other oxide?
26. 0.11g of an oxide of nitrogen gives 56 ml. N_2 at STP 0.15 g of another oxide of nitrogen gives 56 ml. N_2 at STP Show that these data confirm the law of multiple proportions
27. Ammonio contains 82.35% N. Water contains 11. 1% H and nitrogen trioxide contains 36.85% N. Show that these results support the law of reciprocal proportions.



28. An oxide of copper contains 11.2% 0, α chloride of copper contains 35.86% Cl and an oxide of chlorine contains 18.64% O. Show that these data illustrate the law of reciprocal proportion.
29. Hydrogen sulphide (H_2S) contains 94.11% sulphur, water contains 11.11% H and sulphur dioxide contains 50% oxygen. Show that these results support the law of reciprocal proportion.
30. In CO_2 CS_2 and SO_2 the % of C, S and O is 27.27. 84.21 and 50 respectively. Show that these results illustrate the law of reciprocal proportion.

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CLASS 11 (MATHS) DPP (Academy) 01/07/2024

1. If $\sin\theta=\frac{24}{25}$ and θ lies in the second quadrant , then $\sec\theta+\tan\theta=$
2. If θ lies in the the second quadrant , then the value of $\sqrt{\left(\frac{1-sin\theta}{1+sin\theta}\right)}+\sqrt{\left(\frac{1+\sin\theta}{1-sin}\right)}$ is
3. If $2y\cos\theta = x\sin\theta$ and $2x\sec\theta - y\,\mathrm{cosec}\,\theta = 3$, then $x^2+4y^2 =$
4. If $p=\frac{2\,sin\theta}{1+cos\theta+sin\theta}$, and $q=\frac{cos\theta}{1+sin\theta}$, then
5. The value $\cos 105^0+\sin 105^0$ is
6. $\frac{2\sin\theta\,tan\theta(1-tan\theta)+2sin\theta\,sec^2\theta}{(1+tan\ )^2}$
7. $\sin 50^0 - \sin 70^0+\sin 10^0 =$
8. If $\tan x+\tan\left(\frac{\pi}{3}+x\right)+tan\left(\frac{2\pi}{3}+x\right)=3$ then
9. The expression $2\cos\frac{\pi}{13}\cos\frac{9\pi}{13}+\cos\frac{3\pi}{13}+cos\frac{5\pi}{13}$ $is\ equal\ to$
10. $\cos^2\left(\frac{\pi}{4}-\beta\right)-\sin^2\left(\alpha-\frac{\pi}{4}\right)=$
11. $\frac{cot^2 15°-1}{cot^2 15°+1}=$
12. $\frac{sin2A}{1+cos2A}\times\frac{cosA}{1+co}$
13. If $\mathrm{cosec}\,\theta=\frac{p+q}{p-q}$, then $\cot\left(\frac{\pi}{4}+\frac{\theta}{2}\right)=$
14. If $5\tan\theta = 4\ then\ \frac{5\,sin\theta-3cos\theta}{5\sin\theta+2\,cos\theta}=$
15. If α is a root of $25\cos^2\theta+5\cos\theta - 12=0$,$\pi/2<\alpha<\pi$, then $\sin 2\alpha$ is equal to
16. If $\sin^2\theta=\frac{x^2+y^2+1}{2x}$, then x must be
17. If $\sec\theta = m\ and\ tan\theta = n$ then $\frac{1}{m}\left[(m+n)+\frac{1}{(m+n)}\right]=$
18. Minimum value of $27^{\cos 2x}\ 81^{\sin 2x}$ is
19. If A +B + C = $\frac{\pi}{2}$ then $\sum\frac{\cos(B+C)}{Cos\,B\cos C}=$
20. In $\Delta ABC, if\ \tan A/2\ ,\ tanB/2\ and$ C/2 are in A.P., then cos A, cos B and cos C are in

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CLASS 11 (Physics) DPP (Academy) 01/07/2024

1. Check the accuracy of the relation S = $\frac{mgl^3}{4bd^{3Y}}$ where S is the depression produced in the middle of a bar of length l, breadth b and depth d, when it is loaded in the middle 7 with mass m, Y is Young's modulus of the material of bar.

2. Check the correctness of the relation $\tau = I\alpha, where\ \tau\ is\ torque$ acting on a body , I is the moment of inertia and α is angular acceleration.
3. Check the correctness of the equation $\lambda = \frac{h}{mv}\ where\ \lambda$ is wavelength,h is Plancks's constant, m is mass .
4. Check by the method of dimensions whether the following equation is correct T = $2\pi\sqrt{l/g}$ where T is time period of pendulum l is length of pendulum, g is acceleration due to gravity
5. Consider an equation $\frac{1}{2}mv^2$ = mgh where m is mass of body, v is velocity, g is acceleration due to gravity and h is height Check whether the equation is dimensionally correct.
6. Test by the method of dimensions the validity of the equation t = $2\pi\sqrt{\frac{I}{k}}$,where t is the time period of torsional oscillation of body of moment of inertia I about the axis of rotation and & k is the torque per unit radian twist due to torsional reaction of the suspension
7. Time period of oscillating drop of radius r, density p and surface tension S is given by correctness of the relation. T = k $\sqrt{\frac{\rho r^3}{S}}$check the correctness of the relation.
8. The viscous force 'F' acting on small sphere of radius ‘r’ moving with velocity v through a liquid is given by F = 6 πrηv. Calculate the dimension of coefficient of viscosity.
9. Check the correctness of the dimensional equation h = $\frac{2Scos}{r\rho g}$ where h= height, S is surface tension, r=radius, ρ= density and g = acceleration due to gravity.

10. A planet moves round the Sun in a circular nt] orbit. Assuming that the period of revolution / of the planet depends upon radius (R) of its orbit, mass of the sun (M) and universal gravitational constant (G) then prove dimensionally $t^2 \propto \frac{R^3}{GM}$= or t $2\pi\sqrt{\frac{R^3}{GM}}$ where $2\pi\ \ is\ value\ of$ constant.
11. The viscosity of a gas (η) depends on mass (m), the effective diameter (d) and the mean speed of molecules (v). Use dimensional analysis to find η as a function of these variables
12. Assuming that the volume of a liquid flowing per second or (rate of flow of liquid) through a narrow pipe. Depends upon (i) the coefficient of viscosity (η) of the liquid (ii) radius (r) of the pipe (iii) pressure gradient $\left(\frac{p}{l}\right)$ along the pipe. Show by method of dimensions that how rate of flow of liquid depends on these quantities?
13. A small steel ball of radius (r) falling under gravity through a viscous liquid of coefficient of viscosity (η) attains a constant velocity (v). The velocity v depends on the weight (Mg), coefficient of viscosity (η) and the radius of ball (r) using method of dimensions find the expression for v.
14. Given that the time period of oscillations of a gas bubble from an explosion under water depends on static pressure (P), density of water (ρ) and total energy of explosion (E). Using method of dimensions derive expression for time period (t).
15. Suppose that the oscillations of a simple pendulum depends on (i) mass of bob (m) (ii) the length of string (l) (iii) acceleration due to gravity (g) and (iv) angular displacement (θ). Derive the expression for time period of the simple pendulum using method of dimensions.
16. A body of mass 'm' hung at one end of the spring executes S.H.M. The force constant of spring is K while its time period of vibrations is T. Prove by method of dimensions that T = $\frac{2\pi m}{K}$ is incorrect. Derive the correct relation for time period by using method of dimensions
17. The frequency of vibrations (v) of a string having mass depends on length of string (l), tension in string (T) and mass per unit length (m) of string.

Use the method of dimensions to establish the formula for frequency. Value of dimensionless constant = ½.

18. By employing the method of dimensions derive the formula $S = ut + 1/2\ at^2$ where u is initial velocity, S is distance travelled in time / and a is acceleration.
19. Obtain an expression for centripetal force (F) acting on particle of mass (m) moving with velocity (u) in a circle of radius (r) then prove dimensionally.

$$F \propto \frac{mv^2}{r}$$

20. Using method of dimensions derive an expression for the energy of a body executing SHM; assuming this energy depends on its mass (m), frequency (v) and of vibrations (r)
21. 3. Assuming that the critical velocity (u) of a viscous fluid flowing through a pipe depends on its radius (r) density of fluid (p) and coefficient of viscosity (n) of the fluid. then prove dimensionally

$$v_c = \frac{K\eta}{r\rho}$$

22. Reynolds number (a dimensionless quantity) determines the condition of laminar flow of a viscous liquid through a pipe is function of the density of the liquid (ρ) its average speed (v) and coefficient of viscosity (η). N_R is also proportional to diameter of pipe (D). Show from dimensional considerations $N_R \propto \frac{\rho v D}{\eta}$
23. The velocity of the water waves depends upon the wavelength (λ.), density of water (ρ) and acceleration due to gravity (g). Using the method of dimensions obtain relationship between these quantities.
24. Coefficient of viscosity (η) of terpentine oil flowing through a tube is found to depend on (i) the pressure gradient (P/l) (ii) velocity of the oil (v) and distance x from axis of tube (iii) $(r^2 - x^2)$, (r) is radius of tube. By using method of dimensions derive expression for (η).
25. A body of mass (m) is moving in a circle of radius (r) with angular velocity (ω). Obtain an expression for the centripetal force acting on it by the method of dimensions.
26. The frequency (v) of an oscillating drop may depend on the radius of the drop (r), density of the liquid (ρ) and surface tension of liquid (S). Then show dimensionally

$$V = K\sqrt{\frac{S}{\rho r^3}}$$

27. Velocity of sound (v) in a gas depends on the pressure and density (ρ) of the gas. Using dimensional analysis to establish a relation between v, P and ρ.
28. Derive by the method of dimensions, an expression for the escape velocity (v) of a body, assuming that velocity depends on (i) radius of the planet (R) and (ii) acceleration due to gravity (g)
29. The force (F) acting on a body depends upon (i) mass of the body (m) and (ii) acceleration of the body (a). Find the expression for force (F) using method of dimensions.
30. The kinetic energy possessed by a body depends upon its (i) mass (m)(ii) speed (v). Find the expression for kinetic energy of body using the method of dimensions.

NEW STANDARD ACADEMY

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CLASS 11 (BIOLOGY) DPP (Academy) 01/07/2024

1. What is the basis of classification of algae?
2. Mention the ploidy of the following - protonemal cell of a moss, primary endosperm nucleus in dicot, leaf cell of a moss; prothallus cell of fern; gemma cell in Marchantia, meristem cell of monocot, ovum of liverwort, and zygote of fern.
3. Write a note on economic importance of algae and gymnosperms.
4. Both gymnosperms and angiosperms bear seeds, then why are they classified separately?
5. What is heterospory? Briefly comment on its significance. Give two examples.
6. Explain briefly the following terms with suitable examples:
   i. Protonema
   ii. Antheridium
   iii. Archegonium
7. Explain briefly the following terms with suitable examples:
   i. Diplontic
   ii. Sporophyll
   iii. Isogamy
8. Differentiate between the following:
   i. Red algae and Brown algae
   ii. Liverworts and Moss
9. Differentiate between the following:
   i. Homosporous pteridophyte and Heterosporous pteridophyte
   ii. Syngamy and Triple fusion
10. Describe the important characteristics of gymnosperms.
11. Why are bryophytes called the amphibians of the plant kingdom?
12. How far does Selaginella one of the few living members of lycopodiales (pteridophytes) fall short of seed habit?
13. In which plant will you look for mycorrhiza and corolloid roots? Also explain what these terms mean
14. What is an agar?
15. Define the terms morphological isogamy and physiological anisogamy.
16. In what respect endosperm of gymnosperm differs with that of angiosperm?
17. What are water blooms? How are they formed?
18. In which plant group, both sporophyte and gametophyte are represented as independent phases and how?
19. Bryophytes are ecologically more important. Justify the given statement.
20. In rice field, a biofertilizer is used that lives an endophyte in the leaves of water fern. What is that association and how it acts as a biofertilizer?