NEW STANDARD ACADEMY

SEMRI KOTHI SUPER MARKET, RAEBARELI

CLASS 11 (CHEMISTRY) DPP (Academy) 15/07/2024

1. Calculate the number of molecules present in 12.3 g $MgSO_4$ $7H_2O$. Calculate the mass of Na_2CO_3 which will have molecules equal to those present in 12.3g of $MgSO_4$ $7H_2O$.
2. How many grams of sulphur are required to prepare 10 moles of H_2SO_4?
3. Calculate the mass of the following and arrange them in increasing order.
   (a) one gram atom (one mole atom) of nitrogen.
   (b) one silver atom
   (c) one mole of O_2 molecules
   (d) one mole of argon gas
   (e) 1023 atoms of C 12
   (f) one gram iron
4. Calculate the number of oxygen atoms present in 88 g CO_2 What would be the mass of CO having the same number of oxygen atom?
5. A drop of water is about 0.05 ml. The density of water at room temperarure is 1 g/mL How many water molecules are present in a drop of water?
6. 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.
7. Calculate the number of oxalic acid molecules in 63 gram of oxalic acid ($H_2C_2O_4$)
8. How many atoms of Na, C and O are present in 0.5 mole of Na_2CO_3 ?
9. How many mole are there in $1m_3$ of any gas at N.T.P?
10. Find the ratio of number of molecules contained in 1 g NH_3 and 1 g N_2
11. If a mole were to contain 1.0×10^{24} particles, what would be the mass of a single molecule of CO_2?
12. A glucose solution contains 9g of glucose($C_6H_{12}O_6$). How many atom of C, H, and O are present in it?
13. 6 grams of a solute are present in 500 ml of solution, What is the concentration of the solution in grams/litre?
14. A solution is prepared by adding 2 g of a substance. A to 18 g water. Calculate the mass per cent of the solute.
15. Calculate the normality (N) of the solution containing 5g NaOH dissolved in 250 ml. aqueous solution.
16. Calculate the mass of NOCH required to prepare 50 ml of N/10 NaOH solution
17. 5.85 NaCl sold in water so that norm of the solution 0.1N What is the volume of solute?
18. 49 grams of H_2SO_4 are present in 100 ml. aqueous solution. What the molarity of H_2SO Molar mass of H_2SO_4 = 98
19. Calculate the molarity of NaOH in the solution prepared by dissolving its 4 gram in enough water to prepare 250 ml of the solution.
20. How many moles and how many grams are present in 250 ml of 0.5 M NaCl solution
21. Calculate the moles and milli moles of H_2SO_4 in 100 ml of 4M H_2SO_4.
22. A solution of crystalline oxalic acid is prepared by dissolving 0.63 g of $H_2C_2O_4$ $2H_2O$ in 250 rc of solution. Calculate the molarity and normality of the solution
23. 214.2 g of an aqueous solution of sugar contains 34.2 gram sugar. If molecular mass of sugar u 342, calculate the molality of the solution
24. The density of 3 M solution of NaCl is 1.25 g/mL. Calculate the molality of solution
25. An aqueous solution of HCl is 38% by mass and its density is 1.19 g/ml. Calculate the molality and molarity of the solution (HCl = 36.5)
26. A sample of sulphuric acid contains 13% H_2SO_4 by mass and its density is 1.02 g/mL calculate the molality, molarity and normality of this sample.

27. 6.9 M KOH solution contains 30% KOH by masa. Calculate the density of the solution
28. Calculate the mole fraction of ethylene glycol ($C_2H_6O_2$) in a solution containing 20% of $C_2H_6O_2$, by mass
29. A gaseous mixture contains 60% N_2 15% 0_2 and 25% CO_2 by mass. Calculate the mole fraction of each gas.
30. A sugar syrup of weight 214.2 g contains 34.2 g sugar Calculate mole fraction of sugar in syrup.

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CLASS 11 (PHYSICS) DPP (Academy) 15/07/2024

1. The diameter of a sphere is 5.32 cm. Calculate the surface area with due regard to significant figures.
2. Subtract 2.5×10^{-6} from 4.0×10^{-4} with due regard to significant figures.
3. Show how the numerical value of a physical quantity changes with the size of the unit used in the measurement of physical quantity
4. What is the necessity of selecting some units as fundamental units?
5. Why S.I system of units is called as coherent system of units?
6. How many metres are there in one Fermi?
7. How many astronomical units made 1 parsec?
8. Why is it convenient to express the express the distances of stars in terms of light years rather than in metre or kilometre?
9. Is the measure of angle depends on the unit of length?
10. Are there more microseconds in seconds in a second than there are second in a year?
11. If $x = a+bt+ct^2$, where x is in metres and t in seconds what are units of b and c?
12. What is the difference between m N, Nm and nm?
13. Do all the physical quantities have dimensions If so, name such physical quantities which have dimensions?
14. What is the basis of the principle of homogeneity of dimensions?
15. Name any two physical quantities which havy dimensions[$M L^2 T^{-2}$]
16. Can a physical quantity having dimensions may have no units?
17. If 'slap' times speed equals power, what will be dimensional equation for 'slap?
18. In different system of units, can a quantity have different dimensions?
19. Can a physical quantity have units, but still dimensions?
20. What are dimensions of a and b in the relation F = at +bx , where F is force and x is distance.
21. If the unit of force and distance both are tripled then how many times would the unit of energy will be affected?
22. Does the magnitude of a physical quantity depend on the system of units chosen?
23. Justify L + L = L and L - L = L
24. What are the respective number of significant figures for the numbers 23.023, 0.00003 and 2.1×10^{-3}?
25. What is the difference between 4.0 and 4.000?
26. Round off to three significant figures.
    (a) 20.46 m
    (b) 30.68 m
    (c) 30.55 m
27. Why do we have different units for same physical quantity?
28. What are the advantages of defining standard metre in terms of wavelength of light?
29. How will you express 4 light years distance in S.I. units?
30. Why did it become necessary to redefine metre on atomic scale?

NEW STANDARD ACADEMY

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CLASS 11 (MATH's) DPP (Academy) 15/07/2024

1. Prove that $(\cos x + \cos y)^2 + (\sin x - \sin y)^2 = 4\cos^2\frac{x+y}{2}$.
2. In a triangle ABC ,sin A –cos B = cos C, then find angle B
3. Find $\sin\frac{x}{2}$,$\cos\frac{x}{2}$and $\tan\frac{x}{2}$ if $\tan = -\frac{4}{3}$ x in quadrant II .
4. Prove that $\frac{1+sinA-cosA}{1+sinA+cosA} = \tan\frac{A}{2}$.
5. If $\cos A = \frac{3}{4}$ then find the value of $32 \sin\frac{A}{2} \sin\frac{5A}{2}$.
6. If $\tan\frac{\theta}{2} = \sqrt{\frac{a-b}{a+b}}\tan\frac{\phi}{2}$, then prove that $\cos\alpha = \frac{a\cos\phi+b}{a+b\cos\phi}$.
7. Prove that $\sin 47° + sin61° - \sin 11° - sin25° = cos7°$
8. If $A+B+C = \pi$ then prove that $\sin^2\frac{A}{B} + \sin^2\frac{B}{2} + \sin^2\frac{C}{2} = 1 - 2\cos\frac{A}{B}\cos\frac{B}{B}\sin\frac{C}{B}$.
9. If $\alpha = \frac{\pi}{15}$, then prove that $\cos 2\alpha \cos 4\alpha \cos 8\alpha \cos 14\alpha = \frac{1}{16}$
10. Prove that $\cos 10° \, cos30° \cos 50° \cos 70° = \frac{3}{16}$
11. If $\cos^3 x \sin 2x = \sum_{x=0}^{n} a_r \sin(rx) \; \forall x \in R$
12. If $A+B+C = \pi(A, B, C > 0)$ and the angle C is obtuse , then
13. If $\cos x + \cos y - \cos(x+y) = 3/2$ then
14. Minimum value of $2^{\sin 2} + 2^{\cos x}$ is equal to
15. If $a \sin x + b \cos(x+\theta) + b \cos(x-\theta) = d$ then the minimum value of $|\cos\theta|$ is equal to .
16. Find the number of solutions of the equation $5^{\frac{1}{2}} + 5^{\frac{1}{2}log_5(\sin x)} = 15^{\frac{1}{2}+lo\ {}_{15}\cos x}2$ for $x \in [0, 100\pi]$.
17. If $x,y, \in [0, 2\pi]$then find the total number of ordered pairs(x,y) satisfying $\sin x \cos y = 1$.
18. If $3 \sin x + 4 \cos ax = 7$ has at least one solution then find the possible values of a.
19. Solve : $\cos^{50} x - sin^{50} x = 1$
20. $\cos x = 0$ Solve : $\sin x\left(cos\frac{x}{4} - 2\sin x\right) + \left(1 + sin\frac{x}{4} - 2\cos x\right)$

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CLASS 11 (BIOLOGY) DPP (Academy) 15/07/2024

1. Draw diagrams of a typical monocot and dicot leaves to show their venation pattern.
2. Mango and coconut are 'drupe' type of fruits. In mango fleshy mesocarp is edible. What is the edible part of coconut? What does milk of tender coconut represent?
3. How can you differentiate between free central and axile placentation?
4. Why is maize grain usually called as a fruit and not a seed?
5. Rhizome of ginger is like the roots of other plants that grows underground. Despite this fact ginger is a stem and not a root. Justify.
6. Describe various stem modifications associated with food storage, climbing and protection.
7. Stolon, offset and rhizome are different forms of stem modifications. How can these modified forms of stem be distinguished from each other?
8. Give the two most important characters of family Solanaceae
9. What do you understand by the terms syncarpous and apocarpous? Do you find apocarpous condition in any of the flower studied by you?
10. Define capitulum along with its examples.
11. Define the terms (i) Monoecious (ii) Dioecious
12. Differentiate between a simple leaf and compound leaf
13. How a phylloclade differs from a phyllode?
14. Describe vexillary aestivation.
15. Distinguish between albuminous and ex-albuminous seed.
16. Define trimerous and tetramerous and also give examples
17. In which plants it is useless to produce seedless fruits and why?
18. What is placentation? Describe various types along with one example of each.
19. In what way, tap root differs from adventitious roots?
20. How a phylloclade differs from a phyllode?