NEW STANDARD ACADEMY

SEMRI KOTHI SUPER MARKET, RAEBARELI

CLASS 11 (BIOLOGY) DPP (Academy) 08/07/2024

1. What is meant by modification of root ? What type of modification of root is found in the?
   (a) Banyan tree   (b) Turnip   (c) Mangrove trees
2. Explain with suitable examples the different types of phyllotaxy
3. Define the following terms:
   (a) Aestivation   (b) Placentation
4. Define the following terms:
   (a) Actinomorphic
   (b) Zygomorphic
5. Differentiate between:
   (a) Racemose and cymose inflorescence
   (b) Fibrous root and adventitious root
6. Draw the labelled diagram of the following
   (i) Gram seed
   (ii) V.S. of maize seed
7. Describe the various types of placentation found in flowering plants.
8. What is a flower? Describe the parts of a typical angiosperm flower.
9. How do the various leaf modification help plants?
10. Draw diagrams of a typical monocot and dicot leaves to show their venation pattern
11. Why is maize gram usually called as a fruit and not a seed?
12. 13. 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
13. Describe various stem modifications associated with food storage, climbing and protection.
14. Stolon, offset and rhizome are different forms of stem modifications. How can these modified forms of stem be distinguished from each other?
15. Give the two most important characters of family Solanaceae
16. What do you understand by the terms syncarpous and apocarpous? Do you find apocarpous condition in any of the flower studied by you?
17. Differentiate between a simple leaf and compound leaf.
18. How a phylloclade differs from a phyllode?
19. Distinguish between albuminous and ex-albuminous seed
20. Define the terms, scutellum, coleorhiza, coleoptile and aleurone layer

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CLASS 11 (CHEMISTRY) DPP (Academy) 08/07/2024

1. 6gram of C combines with 32 g of S to from CS2. 12 gram C combines with 32 g of O_2 to form CO_2. 20 g of S and 20 g of O_2 combine to form SO_2. Show that these data confirm the law of reciprocal proportion.

2. % N in the three oxides of nitrogen is 63.6%, 46.7% and 34% Show that these data confirm the law of multiple proportion.

3. Copper sulphide contains 66.5% Cu, copper oxide contains 79.99% Cu and sulphur trioxide contains 40% S. Prove that the data is in agreement with law of reciprocal proportions.

4. Prove the law of reciprocal proportions from the following results:
   (i) In phosphorus tri chloride, P = 22.57% Cl = 77.43%
   (ii) In hydrogen chloride, H = 2.77%;, Cl = 97.23%
   (iii) In phosphine, P = 91.18% , H = 8.82%

5. What is the mass of one sodium atom in gram?

6. What is the mass of one molecule of water in gram?

7. Calculate the mass of one hydrogen atom in grams.

8. The mass of 12.04×10^{23} atoms of an element is 112g. Calculate is atomic mass.

9. Mass of 5.6 litre of a gas at STP is 8 g. Calculate its molecular mass.

10. Calculate the number of moles m 49 gram H_2SO_4 (molecular mau=98)

11. Calculate the number of moles and molecules in 1.7 g NH_3.

12. The mass of 3.01×10^{23} molecules of a triatomic gas (A_3) is 12g. Calculate the number of atoms in 8 gram of the gas.

13. Calculate the number of moles, molecules and atoms in 2 litre chlorine at 300K and 2.46 atmospheric pressure

14. An organic compound contains 4% sulphur Calculate its minimum molecular mass of organic compound.

15. Haemoglobin contains 0.25% iron by weight. The molecular mass of haemoglobin is 89600. Calculate the number of iron atoms in one molecule of haemoglobin

16. How many years it would take to spend Avogadro's number of rupees at the rate of 10 lac rupees per second?

17. Chlorophyll contains 2.68% of magnesium by mass. Calculate the number of Mg atoms in 2.0 g chlorophyll.

18. if density of water is $1g /cm^3$ calculate the volume of one water molecule and diameter of one water molecule assuming that it is spherical.

19. Calculate the mass of one silver atom.

20. Calculate the mass of one CO_2 molecule.

21. Calculate the volume of 1.5 moles of N_2 at STP

22. Calculate the volume of 10^{21} molecules of O_2 at STP in cm^3

23. (a) Calculate the number of moles, molecules and atoms in 128 gram sulphur (S_8) .
    (b) Calculate the number of C, H and O atoms in 36 gram glucose ($C_6H_{12}O_6$)

24. Calculate the number of moles and atoms in 44.8 litres of SO_2 at STP

25. Cost of table salt is 2 per kg. What is the cost per mole?

26. Calculate the volume occupied by 10^{22} molecules of N_2 at 27°C and one atmospheric pressure.

27. One million atoms of silver weigh 1.79×10^{-16} g. What is the atomic mass of silver?

28. Calculate the mass of CO_2 molecules whose number is equal to the number of molecules present in 40g oxygen.

29. Calculate the difference in the number of atoms contained in 1g C 12 and 1g C-14.

30. What mass (in kilogram) of K_2O contains the same number of moles of K atoms as are present in one kg KCI?

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CLASS 11 (PHYSICS) DPP (Academy) 08/07/2024

1. The position of a particle moving along X-axis depends on time in accordance with the equation $x = at^2 + bt^3$ where x is in metre and is in second. What are the units and dimensions of a and b? What do these represent?

2. Write the dimensions of a/b in the relation $F = a\sqrt{x} + bt^2$ where F is the force, x is the distance and t is time.

3. What will be the dimensions of a×b in the relation $P = \frac{b-x^2}{at}$ where p is power, x is distance and t is time.

4. In Vander Wall equation $\left[P + \frac{a}{V^2}\right][V - b] = RT$. What are the dimensions and units of a and b?

5. If $v = \frac{A}{t} + Bt^2 + Ct^3$ where v is velocity, t is time and A, B, C are constants then find dimensions of AB/C.

6. In the equation $y = A \sin(\omega t - kx)$ where x and t stands for distance and time respectively. Obtain dimensions of ω and k.

7. When white light travels through glass, the refractive index of glass (v = Velocity of light in air/velocity of light medium) is found to vary with wavelength as $\mu = A + \frac{B}{\lambda^2}$ Using principle of homogeneity of dimensions find S.l unit in which the constants A and B must be expressed.

8. Find the dimensions of (a×b) in the equation $E = \frac{b-x^2}{at}$ where E is energy, x is distance and t is time.

9. Find the dimensions of a/b in the equation $P = \frac{a-t^2}{bx}$ Where P is pressure, x is distance and t is time.

10. If x denotes the distance of an object and can be expressed as $x = K\left[\frac{a\cos\theta + b\sin\theta}{a+b}\right]$ then what are dimensions of K if a and b has dimensions of length.

11. If $x = a + bt + ct^2$ where x is in metre and what are dimensions of a, b, c. Also write S I units of a, b and c

12. Write dimensions of a and b in relation $P = \frac{b-x^2}{at}$ where P is power, x is distance and t is time.

13. Find dimensions of a/b is relation $P = \frac{b-x^2}{bt}$, where x is distance, P is pressure and t is time.

14. State the number of significant figures in following.
    - (1) 4000 m
    - (ii) 4600 kg
    - (iii) 0.030 m.
    - iv) 22.0006

15. Round off the following numbers as indicated
    - (i) 25.654 upto 3 digits (ii) 25.75 upto three digits
    - (iii) 25.654 upto 4 digits (iv) 25.65 upto three digits.
    - (v) 14267 upto 5 digits (vi) 0.7995 upto 1 digits.
    - (vii) 3.7936×10^{-4} upto two digits.

16. Add 6.75×10^3 cm and 4.52×10^2 cm

17. Subtract 2.5×10^4 from 3.9×10^5 with due regard to significant figures.

18. Each side of a cube in measured to be 7.203 m. What is the total surface area and the volume of the cube to the appropriate significant figures?

19. Multiply 3.8 by 0.125 with due regard to the rules for significant figures.

20. The diameter of a circle is 2.486 m. Calculate the area with due regard for significant figures.

21. 5.74 g of a substance occupies 1.2cm^3 Express its density keeping significant figures in view.

22. A jeweller put some ornaments in a box weighing 1.2 kg. Find the total mass of the box and ornaments with due regard for significant figures. Given the mass of ornaments 5.42 g.

23. Add 17.21, 22.141 and 0.0028 and express the result to an appropriate number of significant figures.

24. Subtract 44.27153 from 46.807 and express the result to an appropriate number of significant figures.

25. Radius of sphere is 1.41 cm. Express the volume in appropriate number of significant figures.

26. Calculate the following with regard to significant figures

$$\frac{1.53 \times 0.9995}{1.592}$$

27. The mass and radius of earth are 5.975×10^{24} kg and 6.37×10^6 m respectively. Calculate the earth's average density to correct significant figures. Take $\pi = 3.142$.

28. 9.74 g of a substance occupies 1.2cm^3. Express its density by keeping the significant figures in view.

29. Find the volume of a cylinder of radius 5.3 cm and height 15.5 cm caring for significant figures.

30. Solve $306 \div 5.6$ to correct significant figures.

1. If $\sec \theta - 1 = (\sqrt{2} - 1) \tan\theta$ then $\theta =$

2. If $\tan a \theta - \tan b \theta = 0$ then the value of θ forms a series in

3. 3. If $3\tan(\theta - 15°) = \tan(\theta + 15°)$ then $\theta =$

4. If $\frac{-\pi}{2} \le x \le \frac{\pi}{2}$, then the two curves $y = cos\ x$ and $y = sin\ 3x$ intersect at

5. If the sum of the roots of the equation $\sin^2 \theta = k$ $(0 < k < 1)$ lying in $[0, 2\pi]$ is equal to the sum of the angles of a n-sided regular polygon, then the value of n is

6. If $sin\ A = sin\ B\ cos\ A = cos\ B$ then the value of A in terms of B is

7. If $\cos \theta + \cos 7 \theta + \cos 3 \theta + \cos 5 \theta = 0$ then $\theta =$

8. 8. If $\sin \theta$, 1, $\cos 2 \theta$ are in G.P., then $\theta =$

9. The general solutions of the equation, $\sin^3 \theta \cos \theta - \cos^3 \theta \sin \theta = ¼$, is

10. If $\tan 3 \theta + \tan \theta = 2\tan 2 \theta$ then $\theta =$

11. General solution of the equation $\cot \theta - \tan \theta = 2$ is

12. If then the general value of θ is $\sin^2 \theta - 2\cos \theta + 1/4 = 0$ of θ is

13. If$\sqrt{2} \sec \theta + \tan \theta = 1$ then the general value θ is

14. If $2\tan^2 \theta = \sec^2 \theta$ then the general value of θ is

15. If $2 \sin \theta + \tan \theta = 0$ then the general values of θ given by

16. If $\tan 2 \theta \tan \theta = 1$ then the general value of θ is

17. If $1 + \cot \theta = \csc \theta$ then the general value of θ is

18. If $\frac{1 - cos2\theta}{1 + cos2\theta} = 3$, then the general value of θ is

19. If $\cos 7 \theta = \cos \theta - \sin 4 \theta$ then the general value of θ is

20. If $4 \sin^2 \theta + 2(\sqrt{3}) + 1) \cos \theta = 4 + \sqrt{3}$, then the general value of θ is