KANCH KALVI'S

PROBLEMS BASED -SPECIAL QUESTION PAPER (2016-17)

Class: **X STD** Subject: **SCIENCE** **MARKS; 75**
TIME; 2 Hrs

I.**SOLVE (ANY 20) THE FOLLOWING PROBLEMS (20 x 2 = 40)**

1. Find the concentration of solution in terms of weight percent if 20gm of common salt is dissolved in 60gm of water.
2. 50g of saturated solution of NaCl at 30^{o}C is evaporated to dryness and 13.2g of dry NaCl was obtained. Find the solubility of NaCl at 30^{o}C in water
3. 2g of potassium sulphate was dissolved in 12.5 ml of water. On cooling, the first crystals appeared at 60°C. What is the solubility of potassium sulphate in water at 60°C?
4. How to arrive at the value of GRAM MOLAR VOLUME OF OXYGEN?
5. Find the gram molecular mass of carbon dioxide (CO_2)
6. Calculate the number of moles in i) 90g of water ii) 2g of NaOH
7. Calculate the number of molecules in 11g of CO_2
8. Calculate the mass of glucose in 2 x 10 ^{24} molecules
9. Calculate the number of water molecules present in one drop of water which weighs 0.18 g
10. How many grams are there in the following?
    i) 1 mole of chlorine molecule, Cl_2 ii) 2 moles of sulphur molecules, S_8
11. Find how many moles of atoms are there in:
    i) 2 g of nitrogen. ii) 23 g of sodium
12. Calculate the mass of 0.5 mole of iron.
13. The hydroxide ion concentration of a solution is 1.0 x 10^{-9} M. What is the pH of the solution?
14. A constant force acts on an object of mass 10 kg for a duration of 4 s. It Increases the object's velocity from 2 m s-1 to 8 m s-1. Find the magnitude of the applied force.
15. Which would require a greater force for accelerating a 2 kg of mass at 4 m s^{-2} or a 3 kg mass at 2 m s^{-2} ?
16. The mass of an object is 5 kg. What is its weight on the earth?
17. A current of 0.75 A is drawn by the filament of an electric bulb for 10 minutes.Find the amount of electric charge that flows through the circuit
18. How much work is done in moving a charge of 5 C across two points having potential difference 10 V ?
19. Two resistances 18 Ω and 6 Ω are connected to a 6 V battery in series. Calculate (a) total resistance (b) the current through the circuit
20. Calculate the energy produced when1 kg of substance is fully converted into energy.

21. A concave lens has focal length of 15cm. At what distance should the object From the lens be placed so that it forms an image 10 cm from the lens?
22. A convex mirror used as rear-view mirror in an automobile has a radius of curvature of 3 m. If a bus is located 5 m from this mirror, find the position and nature of the image.

II. .**SOLVE THE FOLLOWING PROBLEMS (7 x 5 = 35)**

23. A bullet of mass 15 g is horizontally fired with a velocity 100 m s-1 from a pistol of mass 2 kg. What is the recoil velocity of the pistol?
24. a) Renu is standing in a dinin line 6.38 x 103 km from the centre of the earth.The mass of the earth is 6.38 X 10^{24}kg. Find 'g'.(3m)
    b) The optical prescription of a pair of spectacle is Right eye : - 3.5 D Left eye : - 4.00 D Which lens has a greater focal length?(2m)
25. a) How many electrons flow through an electric bulb every second, if the current that passes through the bulb is 1.6 A.(3m)
    b) A shoping cart has a mass of 65 kg. In order to accelerate the cart by 0.3 ms-2 what force would you exert on it ?(2m)
26. a) Three resistances having the values 5 Ω , 10 Ω , 30 Ω are connected parallel to each other. Calculate the equivalent resistance.(3m)
    b) An electric bulb is connected to a 220V generator. The current is 0.50 A. What is the power of the bulb?(2m)
27. a) The hydrogen ion concentration of a solution is 0.001 M. What is the PH of the solution?(3m)
    b) Molecular mass of nitrogen is 28.Its Atomic mass is 14.Find the atomicity of nitrogen(2m)
28. Calculate the number of moles in : (i) 12.046 X 10^{23} atoms of Copper (ii) 27.95g of Iron (iii) 1.51 X 10^{23} molecules of CO_2
29. a) An empty evaporating dish weighs 20g.After adding saturated solution of NaNO3,the dish weighs 66.0g. When evaporated to dryness, the dish with crystals weighs 41.5g. Find the solubility of NaNO3 at 20^{o}C. (3m)
    b) Calculate the number of moles for a substance containing 3.0115 x 10^{23} molecules in it.(2m)

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