Diwali Assignment IX

Maths & Science

Science

1. Calculate the energy possessed by a stone of mass 10 g kept at a height of 5 m. (Given g = 9.8 m/s^2)
2. Define 1 J of work.
3. A refrigerator consumes 500000 J of energy per day. Calculate the energy consumed by it in 30 days in commercial units.
4. Derive the formula for kinetic energy i.e. K.E. = ½ mv^2.
5. The volume of 50 g of a substance is 20 cm^3. If the density of water is 1 g cm^{-3}, will the substance float or sink?
6. I) State the law of constant proportions.
   II) Show that water illustrates the law of constant proportions.
7. Compositions of nuclei of two atomic species A & B are given as under:

	A	B
Protons	17	17
Neutrons	18	20

   What are mass numbers of A & B? How many electrons are present in both A & B .

8. I) Calculate the molar mass of Na_2O. (Given, Na = 23u ; O = 16u)
   II) Find mass of 10 moles of Carbon dioxide. (Given, C = 12 ; 0 = 16u)
9. A body of mass 50 Kg runs up a staircase of 40 steps in 8s. If the height of each step is 15 cm, find his power. (Given, g = 10ms^{-2})
10. A student holds a 15 kg bowling ball 1.5 m above the ground for 15 s. How much work is done on the ball?
11. A 1200 kg car traveling at 60.0 km/h hits the brakes and comes to a stop in 32 m. How much work is done on the car?
12. A 3.91 N baseball has 775 J of kinetic energy. How fast is it moving?
13. Find the ratio by mass of the combining elements in the compound – C_2H_5OH.
14. Which of the following weighs the most?
    (a) one g-atom of nitrogen (b) one mole of water
    (c) One mole of sodium (d) one molecule of H_2SO_4
15. The number of moles of carbon dioxide which contain 8 g of oxygen is
    (a) 0.5 mol (b) 0.20 mol
    (c) 0.40 mol (d) 0.25 mol
16. Avogadro's number represents the number of atoms in

(a) 12g of C (b) 320g of Sulphur
(c) 32g of Oxygen (d) 12.7g of Iodine

17. How many atoms of oxygen are present in 50g of $CaCO_3$?

18. How many molecules are present in 1 ml of water? [Hint: Density of water is 1g/ml]

19. Give the names of the elements present in the following compounds and hence make Formulas by exchange of valences.

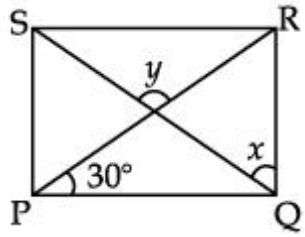
(a) Quick lime
(b) Hydrogen bromide
(c) Baking powder
(d) Potassium sulphate.

20. NaCl is formed by the combination of Na^+ & Cl^- ions similarly H_2SO_4 by H^+ & SO_4^- ions. Given this information find:

- Moles of sulphur atoms in 3.5 moles of **Ammonium** Sulphate ($(NH_4)_2SO_4$).
- Moles of SO_4^- ions present in 2 moles of **Calcium** Sulphate.
- Moles of O_2 present in 5 moles **Aluminium** Sulphate.
  [HINT: First form formulas for all then proceed]

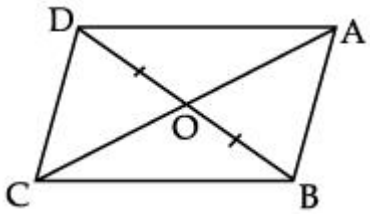
Maths

1. The diagonals of a rhombus are 12cm & 16cm. The length of side of rhombus is
   a) 10cm b) 12cm c) 16cm d) 8cm
2. If two consecutive angles of a ||gm are in ratio 1:3, then the value of smaller angle is
   a) 50^o b) 90^o c) 60^o d) 45^o
3. In figure, PQRS is a rectangle. If $\angle RPQ = 30^o$ then the value of (x + y) is



a) 90^o b) 120^o c) 150^o d) 180^o

4. In a parallelogram show that angle bisectors of two adjacent angles intersect at right angles.
5. In figure, diagonals AC & BD of quadrilateral ABCD intersect at O, such that OB = OD. If AB=CD show that



i) ar(DOC) = ar(AOB)

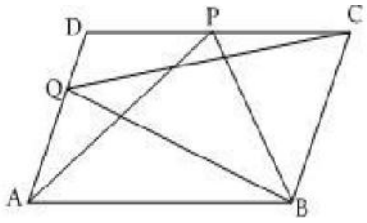
ii) ar(DCB) = ar(ACB)

iii)ABCD is a parallelogram

6. In a parallelogram ABCD if $\angle B=100$ then the value of $(\angle A+\angle C)$ is.
7. Any point on the line x+y=0 is of the form

   a)(-a,a) b)(a,a) c)(0,a) d)(a,0)
8. Find a value of k so that *x=-1* & *y=-1* is a sol^{n} of the linear eq^{n}

   9kx + 12ky = 63.
9. P & Q are any two points lying on the sides DC & AD respectively of a parallelogram ABCD. Show that ar(APB) = ar(BQC).



10. Show that if the diagonals of a parallelogram are equal then it is a rectangle.
11. ABCD is a rectangle in which diagonal AC bisects $\angle A$ as well as $\angle C$. Show that

    i) ABCD is a square

    ii) Diagonal BD bisects $\angle B$ as well as $\angle D$
12. Equation *y = 2x+3* has

    a) Unique soln. b)No soln

    c) Only two solns c)Infinitely many solns
13. In ΔABC, AD is median of ΔABC and BE is median of ΔABD. If ar(ΔABE) = 15cm^2 then ar(ΔABC) is

    a) 60cm^2 b)50cm^2 c)40cm^2 d)30cm^2
14. Two opposite angles of a parallelogram are $(3x - 2)^o$ and $(63 – 2x)^o$. find all the angles of parallelogram.
15. Show that the bisectors of a parallelogram form a rectangle.

* * * * * * *