

**DELHI PUBLIC SCHOOL
BOKARO STEEL CITY**

ASSIGNMENT FOR THE SESSION 2009-2010

Class : IX

Subject : Science & Technology

Assign. No. 3

Section-A (Physics)

1. How will you make use of SONAR to determine depth of a sea?
2. A stone is dropped into a well 44.1m deep. The sound of the splash is heard 3.13 sec after the stone is dropped. Find the velocity of sound in air.
3. Give four differences between longitudinal and transverse waves.
4. What is meant by restoring force? Give an example.
5. Give two important uses of ultrasonic sound.
6. The heart does 1.5 J of work in each heart beat. How many times per minute does it beat if its power is 2 W?
7. A body weighing 10 kg does 20 J of work in 5 sec, what is the power.
8. A body of mass 4 kg initially at rest is moved by horizontal force of 1 N on a frictionless table. Find the work done by the force in 4 sec. Show that this equals the change in K.E. of the body.
9. Wavelength of yellow light is 5890 Angstrom. If the speed of light in air is 300000 km/sec. What is the frequency of vibration?
10. Derive a formula for gravitational potential energy.
11. When the momentum of a body increases by 20%, calculate the percentage increase in its K.E.
12. If the K.E. of a body increases by 300%. Calculate the percentage increase in its momentum.
13. Time period of two pendulum at a given place are in the ratio 1.5:0.44. Calculate the ratio of their length.
14. There is a dip on a road whose radius of curvature is r. A ball of mass "m" put a little away from the bottom of the dip oscillates. Find the period of the oscillation.
15. A horse pulls a cart with a force of 300 N. Such that the system of horse and cart moves with uniform velocity of 18 km/hr on a level road. Calculate the power developed by the horse in W and also find its equivalent horse power.

Section-B (Chemistry)

1. How many years it would take to spend Avogadro's number of rupees at the rate of rupees 10 lac per second?
2.
 - a. Calculate the number of electrons present in 1.6g of methane (CH₄)
 - b. Four samples of H₂O were prepared using different methods. Each sample on analysis was found to contain 12.5% Hydrogen and rest oxygen. Name the law which is in agreement with this observation.

3.
 - a. Calculate the number of atoms in 0.008g Phosphorus (P=31)
 - b. How many grams of sodium will have the same number of atoms as 6g of Mg (Mg=24, Na=23)
 - c. What mass of oxygen, O₂ will contain the same number of molecules as
 - i. 2.5moles of chlorine gas
 - ii. 6.4g of sulphur dioxide
 - iii. 6.023X10²² molecules of water H₂O (O=16, Cl=35.5, S=32, H=1)
 - iv. How many "gram atoms" of each element are there in 9.8g of sulphuric acid? (H=1,S=32,O=16)
4.
 - a. Calculate the percentage composition of all the elements present in KMnO₄ (K=39,Mn=55, O=16)
 - b. Calculate the percentage composition of all the elements present in calcium phosphate (Ca₃(PO₄)₂) (Ca=40, P=31, O=16)
5.
 - a. Calculate the number of constituent atoms in 53g of Na₂CO₃ (Na=23, C=12, O=16)
 - b. 10²² atoms of an element X are found to have a mass of 930mg. Calculate the molar mass of the element X.
 - c. Calculate the number of molecules present in 1L of water assuming that density of water is 1g/cc.
6.
 - a. arrange the following in order of increasing mass
0.1g atom of Ag, 0.1mol of H₂SO₄, 10²³ molecules of CO₂ gas, 1g of C, 10²³ atoms of Ca.
 - b. What is formula unit mass? For what type compounds this term is used.
7.
 - a. The relative atomic mass of copper is 63.5. It exists as two isotopes, which are ²⁹Cu⁶³ and ²⁹Cu⁶⁵. Calculate the percentage of each present in it.
 - b. The element boron occurs in nature as two isotopes having atomic masses 10u and 11u. What are the percentage abundances of these isotopes in a sample of boron having average atomic mass of 10.8u?
8.
 - a. Number of protons, neutrons and electrons in four species A,B,X and Y are respectively 6,6,6: 7,7,7: 6,8,6:and 9,10,10. Give symbolic representation of each species and tell which of them are isotopes and which are isobars.
 - b. Explain
 - i. an electron is regarded as a universal particle.
 - ii. why is a proton not a universal particle like electron.
 - iii. Do protons originate from an anode?
 - c.
 - i. Define Isotopes, Isobars and Isotones with examples.
 - ii. Write applications of isotopes in different fields.
9.
 - a. Write the electronic configuration of P³⁻(p=15), S²⁻(s=16), Cl⁻(Cl=17)
 - b. Write the electronic configuration of Ca⁺²(Ca=20), Mg⁺²(Mg=12), Al⁺³(Al=13).
 - c. Atomic number of an element A is 18 and that of B is 19. Which one will be more reactive chemically? Why?
10. Substances A to E have in them the distribution of electrons, neutrons and protons, making use of these data, Find
 - i. a cation,
 - ii. an anion,
 - iii. a pair of isotopes.
 - iv. an atom of noble gas.

substance	e	n	p
A	4	4	3
B	8	9	0
C	18	22	18
D	17	20	17
E	17	18	17

11. What are the important factors that determine the fertility of soil.
12. a. Write a short note on the green house effect, acid rains, and land and sea breezes
13. a. Explaining about different smogs and nature.
b. Define biosphere. How CFC deplete ozone layer?
14. a. Why ozone layer depletion occurs over poles.
b. expand the following CNG, PCB, LNG, LPG, DO, BOD, COD, MIC, PCB, PAN.
15. a. Explain about different cycles.
b. Explain different harmful effects of acid rain on different fields.
c. Which of the following deplete the ozone layer in the stratosphere
i. $C_6F_6Cl_6$, C_7F_{16} , CF_2Cl_2 , C_6F_6
d. besides O_2 , other greenhouse gas is
 CH_4 , N_2 , Ar, O_2 .

Section-C (Biology)

1. Define the following -- triploblastic organisation, radial symmetry, metamerism, assimilation, animal husbandry, vectors, immunisation
2. What are the characteristic features of the following groups -porifers, coelenterates, annelids, molluscs, echinoderms
3. State the salient features of the vertebrates. How does Protochordates differ from vertebrates?
4. Depict the various steps of nitrogen, oxygen and water cycle operating in nature.
5. What are the important steps of carbon cycle? Draw the carbon cycle.
6. What are the different ways of increasing the yield of animals? Suggest any two ways for the same.
7. What is pisciculture? How is composite fish culture done? What are the advantages and disadvantages in such culture?
8. Why do we need to classify or categorise microorganisms? State the important groups of microorganisms and the diseases caused due to them.
9. What are the different ways to prevent spread of diseases? How can diseases be controlled? Suggest any three ways to control the spread of diseases.
10. In what ways antibiotics help to control diseases? In which group of organisms antibiotics are effective? Why is it not effective against virus?

-----x-----