

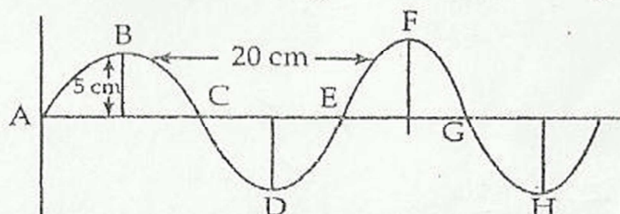
Physics Assignment Sa2

1. Give an expression to show the relation of power with work and time.
2. What is the charge and mass of a neutron ?
3. Mention two conditions necessary for work to be done.
4. What is the number of protons and neutrons in an element represented as ${}_{12}^{24}\text{Mg}$?
5. An electric bulb of 100 W works for 6 hrs a day. Calculate the units of energy consumed in 1 month of 30 days.
6. Mention any two points Rutherford put forward to explain the nuclear model of an atom.
7. Calculate the number of moles for the following :
 - (A) 84 g of nitrogen atom
 - (B) 8.066×10^{23} number of nitrogen atoms (given atomic mass of N=14)
8. Calculate the mass of 3.011×10^{23} number of N atoms :
(given atomic mass of nitrogen = 14)
9. A student lifts an object in the upward direction. In doing so, he applies the force on the object in the upward direction and displaces it in that direction :
(However, the force of gravity is also acting on the object.)
 - (A) State the direction in which force of gravity is acting on it.
 - (B) Which one of these forces is doing positive work ? Give reason.
 - (C) Which one of these forces is doing negative work ? Give reason.
10. A sound wave has a frequency of 2 kHz and a wavelength of 45 cm. It takes 4 s to travel. Calculate the distance it travels.
11. The average atomic mass of a sample of an element X is 16.2 u. What is the percentage of each isotope ${}_{8}^{16}\text{X}$ and ${}_{8}^{18}\text{X}$?
12. (A) Write the formulae of :
 - (i) Sodium Chloride
 - (ii) Aluminium Oxide
 - (iii) Ammonium Sulphate(B) Write the names of the compounds represented by the following formulae :
 - (i) KNO_3
 - (ii) CaCO_3
 - (iii) H_2S
13. (A) How does the temperature affect the speed of sound ?
 - (B) What determines the pitch of a sound ?
 - (C) Give a graphical representation of low pitched and high pitched sound.
 - (D) What is an echo ?
 - (E) What is the range of frequency associated with :
 - (i) Infrasonic sound
 - (ii) Ultrasonic sound

- 1 What do the species ${}^3_1\text{A}$ and ${}^3_2\text{B}$ represent ?
- 2 Find the formula unit mass of NaHCO_3 :
(Atomic mass of Na = 23u, H = 1u, C = 12u, O = 16u)
- 3 Why do we hear sound of an approaching car before car reaches us ?
- 4 Atomic number of aluminium is 13 and mass number is 27. Calculate the number of electrons, protons and neutrons in its atom. Represent the ion of this element.
- 5 Mention any two applications of ultra sound and explain any one of them.
- 6 Identify the solute and solvent in :
(A) Sugar Solution (B) Soda Water
- 7 (A) Calculate the number of moles in 112 g of iron.
(B) Calculate the mass of 0.5 moles of sugar ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$).
(C) Calculate the number of atoms in 8 g of oxygen O_2 molecules.
(Atomic Mass of Fe = 56 u, C = 12u, H = 1u, O = 16u ; $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$)
- 8 (A) State the law of conservation of mass.
(B) What mass of silver nitrate will react with 5.85 g of sodium chloride to produce 14.35 g of silver chloride and 8.5 g of sodium nitrate, if the law of conservation of mass is true ?

9 Waves of frequency 100 Hz are produced in a string as shown in the figure. Give its

- (A) amplitude
(B) wavelength
(C) velocity
(D) nature



- 10 A car weighing 1200 kg is uniformly accelerated from rest and covers a distance of 40 m in 5 seconds. Calculate the work done by the engine of car during this time. What is the final Kinetic Energy of car ?
- 11 (A) Define work and write its SI unit.
(B) State three conditions for which mechanical work is zero ?
- 12 (A) Why do the inert gases like Neon and Argon have zero valency ?
(B) The atomic number of sodium is 11 and oxygen is 8. Predict their valencies.
(C) Draw the schematic atomic structure of ${}^{24}_{12}\text{Mg}$
(D) State the difference between a proton and an electron on the basis of their location.
(E) Give one use of an isotope of cobalt and one use of an isotope of iodine.
- 13 (A) State the law of conservation of energy.
(B) What type of energy transformation takes place in the following :
(i) electric cell
(ii) electric fan
(C) Establish the relationship between SI and commercial unit of energy.