

PHYSICS

Q1. Describe Thrust. Write its SI unit.

Q2. A block of mass m is raised from position A to B by taking two different parts as shown.

Let the height $AB = h$. Answer the following questions.

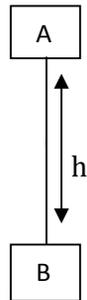


Fig 1

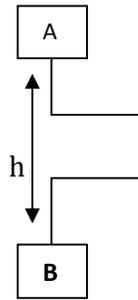


Fig 2

a) What is the work done on the block in Fig 1 and Fig 2.

b) Name the energy possessed by the block at position B in both the cases.

Q3. a) An electric heater is rated 200 W. How much energy does it use in 5 hours.

b) Establish the relation between the commercial unit and SI unit of energy.

Q4. Give an example each of the following energy transformation

a) Heat energy into Mechanical energy.

b) Mechanical energy into Electric energy.

Q5. The kinetic energy of an object moving with a velocity of 5 m/s is 25 J. Find the mass of the object. What will be its kinetic energy when its velocity is 2 times? Justify your answer.

Q6. What is meant by power of machine from a 20 m high fall nearly 25 Metric tonnes of water fall per second. Calculate the equivalent power if all this energy is utilised? ($g = 10\text{m/s}^2$)

Q7. State the meaning of 1 Pascal. A boy of mass 40 kg is standing on loose sand, if the area of his Feet is 0.04 m^2 . Calculate the pressure exerted by the boy.

Q8. Distinguish between positive and negative work. When you lift an object, two forces act on it. Identify these forces.

Q9. State the difference between density and relative density.

Q10. Define the following terms. State its SI unit.

a) Wavelength

b) Time period

c) Amplitude.

CHEMISTRY

Q1. Water molecule has hydrogen and oxygen in the ratio of 1: 8 by mass. Find the ratio number of atoms in the molecule.

Q2. a) Draw a diagram showing the observations made by Rutherford in alpha particles scattering experiments .

b) Why did Rutherford use a gold foil the experiment mentioned in part (a) ?

c) List three conclusions drawn by Rutherford from his experiment. State three features of nuclear model of an atom put forward by Rutherford.

Q3. a) State the limitations of J.J. Thomson's model of an atom.

b) Define valency by taking the examples of magnesium (At. No: 12) and oxygen (At. No : 8).

c) Describe Bohr's model of atom.

Q4. a) Calculate the number of particles in each of the following :

i) 46 g of Na atoms

ii) 8 g of O₂ molecule

iii) 0.1 mole of carbon atoms.

b) Convert following into mole :

i) 12 g of O₂ gas

ii) 20 g of water

iii) 22 g of CO₂

Q5. a) Give the relationship between mole, mass and Avogadro's number.

b) Write the chemical formula of the following compounds :

i) Hydrogen nitride

ii) Hydrogen peroxide

iii) Hydrogen carbide

iv) Calcium fluoride

v) Iron (II) bromide

vi) Silver Iodide

vii) Ammonium carbonate

viii) Barium sulphate

ix) Calcium phosphate

Q6. a) Calculate the molecular masses of the following compounds :

i) Acetic acid (CH₃COOH)

ii) Ethanol (C₂H₅OH)

iii) Carbon dioxide

b) Calculate the mass of the following :

i) 0.5 mole of N₂ gas(mass from mole of molecule)

ii) 0.5 mole of N atoms (mass from mole of atom)

iii) 3.011×10^{23} number of N atoms(mass from number)

iv) 6.022×10^{23} number of N₂ molecules (mass from number)

c) Calculate the number of particles in each of the following :

i) 46 g of Na atoms (number from mass)

ii) 8 g of O₂ molecules (number of molecules from mass)

iii) 0. 1 mole of carbon atoms (number from given moles)

Q7.a) Which of the following weighs most ?

i) 32 g of oxygen

ii) 2.0 g of atoms of nitrogen

iii) 0.5 mole of iron

iv) 3.011×10^{23} atoms of C.

b) Calculate the number of atoms in each of the following : (at. masses : H = 1, S = 32, Fe = 56)

i) 0.08 g of hydrogen

ii) 0.008 g of sulphur

iii) 0.8 g of iron.

Q8.a) Write the names of the following compounds :

i) Ca_3N_2

ii) $\text{Mg}(\text{HCO}_3)_2$

iii) $(\text{NH}_4)_2\text{CO}_3$

iv) $\text{Zn}_3(\text{PO}_4)_3$

v) $\text{Al}_2(\text{SO}_4)_3$

vi) FeCl_3

b) The average atomic mass of a sample of an element X is 16.2 u. What are the percentages of isotopes $^{16}\text{X}_8$ and $^{18}\text{X}_8$ in the sample.

c) Elements A, B, C and D have atomic numbers 11, 8, 1 and 17 respectively. Give the chemical formulae of the compounds formed between (i) A and D (ii) B and C.

Q9. Substances from A to E have in them, the distribution of electrons, neutrons and protons as follows :

Substance	Electrons	Neutrons	Protons
A	4	4	3
B	8	9	9
C	18	22	18
D	17	20	17
E	17	18	17

Making use of these data find (i) a cation (ii) an anion (iii) a pair of isotopes (iv) an atom of noble gas.

Q10. a) The nuclear composition of two atomic species X and Y is as follows:

X : 17 Protons, 18 Neutrons

Y : 17 Protons, 20 Neutrons

What are their (i) atomic numbers (ii) mass numbers? What is the relation between these two atomic species? Name the element or elements which they represent.

b) An atom has electronic configuration of 2, 8, 7 :

(i) What is the atomic number of the element?

(ii) Which of the following elements have same number of valence electrons?

N (7), F (9), P (15) and Ar(18)

BIOLOGY

Q1. Write a note on how forest influences the quality of our air, soil and water resources.

Q2. Differentiate between phanerogams and cryptogams.

Q3. a) Define nomenclature. Give the scientific name for peacock.

b) Who introduced the binominal nomenclature? Enlist the rules or conventions followed while writing the scientific names.

Q4. Give one use of lichens.

Q5. Explain how HIV Aids virus affects and damages our body?

Q6. Why whales are not grouped under Pisces?

Q7. What are the criteria for classification of organisms belonging to kingdom Monera & Protista.

Q8. a) What are the different means by which infectious diseases are spread?

b) Define vectors. Give two examples of vector-borne diseases. Explain the method of preventions of malaria.

Q9. a) What are the methods of reducing soil erosion?

b) What is Green- house effect?

Q10. What precautions will you take to justify "Preventions is better than cure".

