Practice Paper 3*

(Unsolved)

Section A

1. Read the following and answer the questions from (i) to (iv) given below

The combining capacities of different elements are compared with that of hydrogen. The valency of hydrogen is taken as **1** and the valencies of all other elements are measured against this standard. An atom of calcium always combines with two atoms of hydrogen to form calcium hydride, a compound of calcium and hydrogen. Hence, the combining capacity or valency of calcium is twice that of hydrogen.

But, there are elements which do not combine with hydrogen at all. However, they can combine with chlorine. For example, gold does not combine with hydrogen but it combines with chlorine to form a compound ($AuCl_3$), in which one atom of gold is united with three atoms of chlorine.

Since, the valency of chlorine is one, we conclude that the valency of gold must be three. Hence, valency is measured by the number of hydrogen or chlorine atoms which combine with or are displaced by one atom of the element. There are some elements which show different valencies in different compounds. Copper shows two valencies, one and two.

In the red oxide of copper, its valency is one, while in the black oxide, its valency is two. Similarly, iron shows valency two and three.

(i) The element **B** shows valencies of 4 and 6. The formulae of its two oxides respectively are

(a) BO_3, BO_2 (b) B_2O_6, BO_4

(c) BO_2, BO_3 (d) $BO_{4,} B_2O_6$

(ii) The formula of the sulphate of an element **X** is $X_2(SO_4)_3.$ The formula of nitride of the element **X** is

(a) X_2N (b) XN_2 (c) XN (d) X_2N_3

(iii) Number of valence electrons present in N^{3-} ion is

(a) 16   (b) 10   (c) 7   (d) 4

(iv) What is the formula of the compound formed by the ions Al^{+3} and SO_4^{2-}?

(a) $Al_2(SO_4)_3$ (b) $AlSO_4$

(c) $Al(SO_4)_3$ (d) $2AlSO_4$

Or

The formula of oxide of an element Z is Z_2O_3. What is the valency of element Z?

(a) 1   (b) 2

(c) 3   (d) 4

2. Read the following and answer the questions from (i) to (iv) given below

Unlike universal gravitational constant, the value of acceleration due to gravity is not constant on the surface of the Earth. It varies from place to place and thus, the weight of a body changes from place to place. The value of acceleration due to gravity on the surface of the earth at its equator is taken as standard and is equal to 9.8 ms^{-2}.

(i) The weight of a body is the force with which a body is attracted by the earth towards its centre. What is the weight of an object at the point **A** shown in figure?
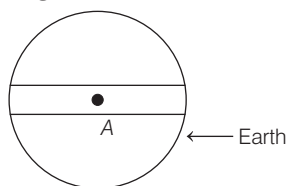
(a) Zero   (b) Infinite

(c) R times the weight at the surface of earth

(d) $\dfrac{1}{R^2}$ times the weight at the surface of earth

(ii) Where will it be profitable to purchase one kilogram sugar?

(a) At poles   (b) At equator

(c) At 45° latitude   (d) At 40° latitude

(iii) Which of the following graphs correctly represents the variation of **g** on earth.
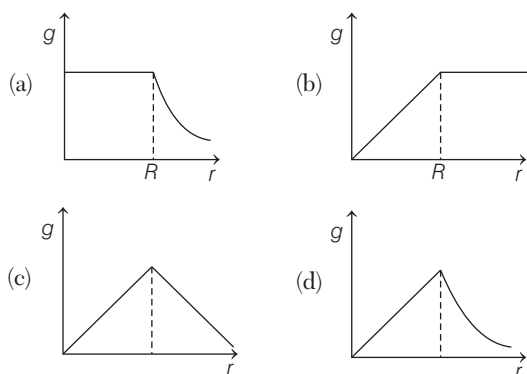
(iv) The value of **g** on the moon is $\dfrac{1}{6}$th that on the earth. A body weighing 60 N on the earth, has weight on the moon as

(a) 20 N   (b) zero

(c) 360 N   (d) 10 N

Or

If we go inside a mine and drop a 10 kg iron ball and 1 kg aluminium ball from the top of a high platform, then which of the following is not true?

  I. Both will reach the floor at the same time.

 II. 1 kg weight will reach the floor first.

III. 10 kg weight will reach the floor first.

IV. It is not possible to indicate which of the two will reach the floor first without further data.

(a) I and II   (b) II and IV

(c) I, II and III   (d) II, III and IV

3. Read the following and answer the questions from (i) to (iv) given below

Disease is any harmful deviation from the normal structural and functional state of an organism. It is generally associated with certain signs and symptoms and differs in nature.

The study of disease is called pathology. It involves the determination of the cause of the disease, the understanding of the mechanisms of its development, the structural changes associated with the disease process and the functional consequences of these changes observed. The process concludes by identifying the proper course of treatment.

Causes of disease can be classified into

1. First level of causes (Pathogen)

2. Second level of causes (Lack of balanced diet)

3. Third level of causes (Poverty)

(i) Give examples of first level causes of diseases.

(ii) Aman is suffering from bleeding gums. Explain the level of cause of disease that he might be suffering from.

(iii) Sohail's family lives in a slum area where they lack even the basic public services. They face poor economic condition. Some members of his family suffer from other illnesses also. What could be the level of cause of their illness?

(iv) Name two diseases that are caused due to immediate cause.

Or

What are infectious agents?

Section B

4. It was diagnosed that a patient has lost the power of fighting against any infection.

(i) Name the disease from which the patient is suffering from.

(ii) Name the pathogen responsible for the disease. **[2M]**

Or

What is the purpose of dividing infectious diseases into various categories? **[2M]**

5. Find out the valency of atoms represented by the following figures.

(i) (ii) (iii) (iv)

[2M]
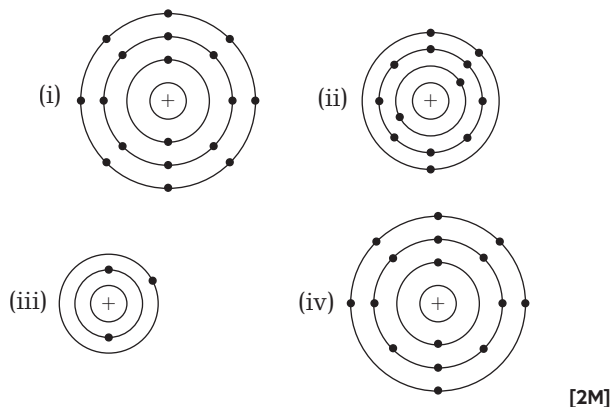
6. Differentiate between immediate and contributory causes of a disease. **[3M]**

Or

List the factors responsible for soil formation. **[3M]**

7. (i) What are inert elements? Why are they called so?

(ii) What is the valency of these elements and why?

(iii) How many electrons can be accommodated in a M and N-shell?

Or

Explain Bohr and Bury rules for distribution of electrons into different shells. **[3M]**

8. Find the ratio of gravitational potential energy, if height of an object is doubled and mass is tripled. Also, find the ratio of work done by gravity in bringing the object to zero height in both cases. **[3M]**

[**Ans.** 6 : 1, 6 : 1]

Section C

9. (i) A battery lights a bulb. Describe the energy changes involved in the process.

(ii) Calculate the amount of work needed to stop a car of 500 kg moving at a speed of 36 kmh^{-1}.

[**Ans.** $-25000\ Js^{-1}$]

Or

A body of mass 20 kg is raised to the top of a building 15 m high and then dropped freely under gravity.

(i) Find out the work done in raising the body to the top of the building. [**Ans.** 3000 J]

(ii) What will be the value of gravitational potential energy at the top of the building? [**Ans.** 3000 J]

(iii) By what factor will the gravitational potential energy of the same body increases, if it is raised to the top of a multi-storey building 45 m high?

[**Ans.** 3 times]

(iv) When will the kinetic energy of the body be maximum?

10. Find the ratio by mass of the combining elements in the following compounds

(i) $CaCO_3$ (ii) $MgCl_2$

(iii) H_2SO_4 (iv) C_2H_5OH

(v) NH_3 (vi) $Ca(OH)_2$

Or
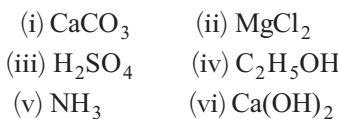
An element $_7^{14}A$ exists as diatomic gas in nature which is relatively inert and forms 78% of earth's atmosphere.

(i) Identify the gas and write its molecular formula. Write the formulae of nitrite and nitrate ions.

(ii) How many moles of this gas would contain 12.044×10^{23} atoms of this element?

[Avogadro's number $= 6.022 \times 10^{23}$]

[**Ans.** 12.044×10^{23}]

(iii) Calculate the molecular mass of
(a) NH_4NO_3 and (b) HNO_3
[Given atomic masses N $= 14$ u, O $= 16$ u, H $= 1$ u]

[**Ans.** 80 u and 63 u]

11. Verify by calculating that

(i) 5 moles of CO_2 and 5 moles of H_2O do not have the same mass.

(ii) 240 g of calcium and 240 g magnesium elements have a mole ratio of 3 : 5.

Or

A silver ornament of mass m gram is polished with gold equivalent to 1% of the mass of silver. Compute the ratio of the number of atoms of gold and silver in the ornament. [**Ans.** 108 : 19700]

Answers

1. (i) - (c); (ii) - (c); (iii) - (b); (iv) - (a, b)

2. (i) - (a); (ii) - (b); (iii) - (d); (iv) - (d, d)