

Maharashtra State Board
Class X Science and Technology Part-I

Answer Paper Set-2

Time : 2 Hrs

Marks : 40

Q. 1A) Solve the following questions. 05

i) Goa beach. 1

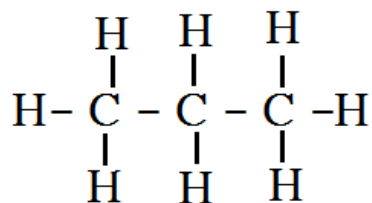
ii) Iron (Fe) undergoes oxidation and Sulphur (S) undergoes reduction. 1

iii) Generator. 1/2

All others are related to safety measures to avoid mishap due to 1/2
electricity.

iv) Farsightedness or hypermetropia. 1

v) 1



Q. 1B) Choose and write the correct option. 05

(i) c) bromine 1

(ii) c) tinning 1

(iii) b) Substitution 1

(iv) c) salt 1

(v) c) real and inverted. 1

Q.2 Solve ANY FIVE from the following questions. 10

i) a) displacement reaction. 1

b) The reaction in which the place of the ion of a less reactive element in a compound is taken by another more reactive element by formation of its own ions, is called displacement reaction. 1

ii) Given :

Velocity of light in a first medium = $V_1 = 1.5 \times 10^8$ m/s

Velocity of light in second medium = $V_2 = 0.75 \times 10^8$ m/s

Refractive index of second medium = ${}_2n_1 = ?$

$${}_2n_1 = \frac{V_1}{V_2} \quad 1/2$$

$${}_2n_1 = \frac{1.5 \times 10^8}{0.75 \times 10^8} \quad 1/2$$

$$= 2 \quad 1/2$$

Hence, the refractive index of second medium with respect to first medium is 2. 1/2

iii) a) The block shown by box A is s-Block. 1/2

S(16) = 2, 8, 6 (electronic configuration of any element in s block) 1/2

b) The block of element denoted by letter B is d – Block. 1/2

The period number of that element is 4. 1/2

iv) a) $\text{CH}_3\text{-CHOH-CH}_3$: Propan – 2 – ol 1

b) $\text{CH}_3\text{-CH}_2\text{-COOH}$: Propanoic acid 1

v) Tungsten metal is used to make solenoid type coil in an electric bulb because :

1) Tungsten metal has high resistance and high melting point (nearly 3422°C) 1

2) Because of current it gets heated at high temperature and emits light. 1

vi) **Given** : $r = 1$ m, $m_1 = 75$ kg, $m_2 = 80$ kg

and $G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$

According to Newton's law,

$$F = \frac{G m_1 m_2}{r^2} \quad 1/2$$

$$F = \frac{6.67 \times 10^{-11} \times 75 \times 80}{1^2} \text{ N} \quad 1/2$$

$$= 4.002 \times 10^{-7} \text{ N} \quad 1/2$$

The gravitational force between Mahendra and Virat is 4.002×10^{-7} N 1/2

vii) The process shown in the diagram is Anodization. 1

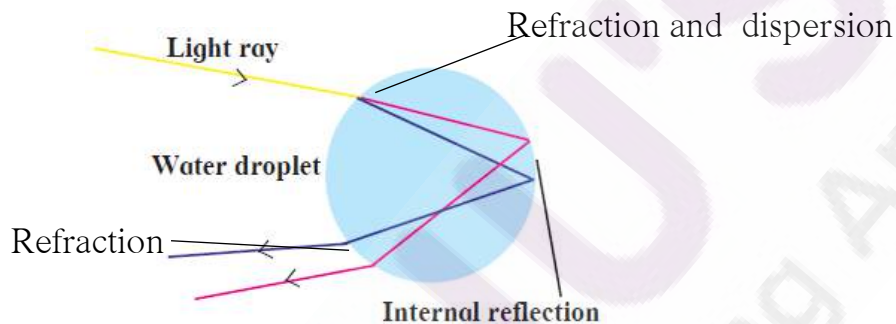
In this method metals like copper, aluminium are coated with a thin and strong layer of their oxides by means of electrolysis. For this the copper or aluminium article is used as anode. As this oxide layer is strong and uniform all over the surface, it is useful for prevention of the corrosion of the metal. 1

Q.3 Solve ANY FIVE from the following questions. 15

i) a) The natural process shown in the figure is formation of rainbow. 1

b) The phenomena observed in this process are refraction, internal reflection and dispersion of light. 1

c) 1



ii) Kepler's laws of planetary motion :

a) The orbit of a planet is an ellipse with the Sun at one of the foci. 1

b) The line joining the planet and the Sun sweeps equal areas in equal intervals of time. 1

c) The square of period of revolution of planet around the Sun is directly proportional to the cube of the mean distance of a planet from the Sun. 1

iii) a) The atomic number of this element is 20. 1

b) The group of this element 2. 1

c) This element belongs to fourth period. 1

iv) The importance of artificial satellites :

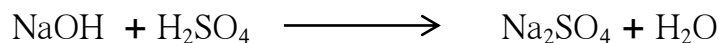
any three points of importance of artificial satellite is related to weather, communication, broadcasting, navigation, defence, observation (any three points each point carries 1 mark) 3

v) a) The instrument shown in figure is generator. 1

b) This machine is used to generate electricity. 1

c) The generator generates electricity through following transformations :
Mechanical Energy \rightarrow Electrical Energy 1

vi) Step 1) Write chemical equation



Step 2) Compare number of atoms of each elements on each side. **1**

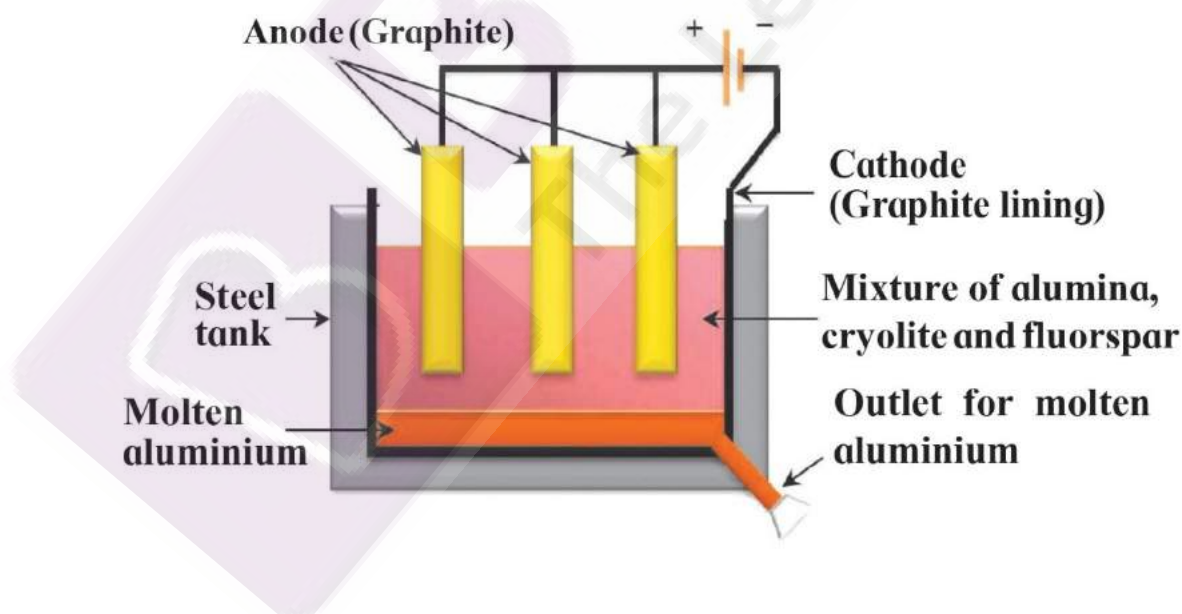
Elements	Number of atoms on reactant side	Number of atoms on product side
Na	1	2
O	5	5
H	3	2
S	1	1

Step 3) Start balancing and write balanced equation.

Elements	Number of atoms on reactant side	Number of atoms on product side
Na	1	2
O	6	6
H	4	4
S	1	1



vii) Electrolytic reduction of Alumina :



Q.4 Solve ANY ONE from following questions.

05

i) a) Heat is transferred from hot object to cold object.

01

b) This process shows the principle of heat exchange.

01

c) In this process, the cold object gains heat energy and the hot object loses heat energy.

01

If the system of both the objects is isolated from the environment,
Heat energy lost by the hot object = Heat energy gained by the cold object.
This is called the principle of 'Heat Exchange'.

01

d) The specific heat of the substance is measured by using this principle.

01

ii) a) Arrangement of lenses shown in the figure is refracting telescope.

01

b) 1) object lens collect the light coming form the distant object and forms the image

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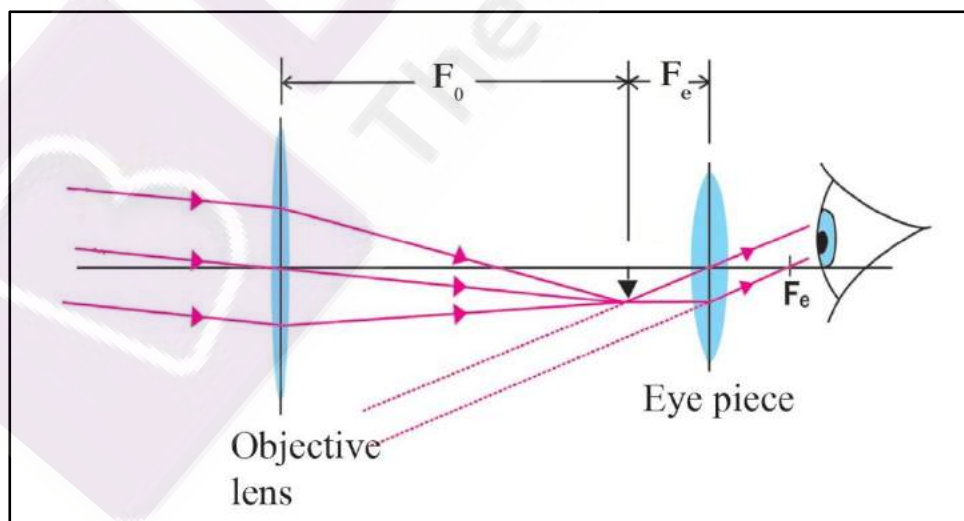
2)The image works as object for the eye piece which forms the final image.

01

c) We can get different magnifications by using the eye piece with different focal lengths.

01

d)



01