Answers Paper-2

Q.1. (A) Choose the correct answer and write the letter of the alphabet of it :   5
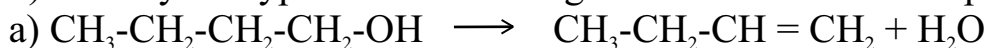1. A) Rancidity   2. C) third   3. D) 3×10^{8} 4. D) Tungsten
5. A) International Space Station

B) Answer the following :   5
1) Name the following :
   The period with electrons in the shell K, L and M.
Ans : Period 3

2) Identify the type of the following reaction of carbon compounds :
a) $CH_3\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}OH \longrightarrow CH_3\text{-}CH_2\text{-}CH = CH_2 + H_2O$
Ans : Dehydration reaction

3) Complete the analogy :
   Myopia : Concave lens :: Farsightedness : **Convex lens**

4) Write the full form of the following :
   ISRO
Ans : Indian Space Research Organisation

5) State wether the following statement is True or False :
   Covalent compounds have high melting and boiling points.
Ans : False. Covalent compounds have <u>low</u> melting and boiling points.

Q. 2 (A) Give scientific reason : (*any* TWO)   4
1) Geostationary satellites are not useful for studies of polar regions.
Ans : i) Geostationary satellites have orbits parallel to the equator and the observation of
         polar regions is not carried out properly.
      ii) For this purpose, elliptical medium earth orbits passing over the polar region are
         used.

2) Sodium is always stored under kerosene.
Ans : 1. Sodium is highly reactive metal.
        2. Sodium reacts with oxygen in air and form sodium oxide.
        3. Therefore, it catches fire and starts burning.
        4. It does not react with kerosene and sink in it.
           Therefore, it is stored under kerosene to prevent its reaction with oxygen,
           moisture and carbondioxide.

3) Metallic character goes on decreasing while going left to right in a period.
Ans : i) Copper is good conductor of heat as compared to steel.
    ii) Hence, copper bottom gets heated faster than steel.
    iii) This reduces the time for cooking as well as saves heat energy and fuel. Hence, The bottom of some steel utensils used for cooking is copper.

Q. 2 (B) Answer the following : (*any* THREE)   6
1) Write short note on : Free fall
Ans : i) When a body falls towards the Earth under the influence of the Earth's gravity alone, it's motion is called a free fall.
   ii) In free fall, the initial velocity of the object is zero and goes on increasing due to the acceleration .
    iii) The frictional force due to air opposes the motion of the object and a buoyant force also acts on the object.
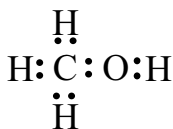   iv) Hence, the free fall is possible only in a vacuum.

2) Draw an electron dot structure of the following molecules. (Without showing the circles)
Ans : a) Ethene - Molecular formula - C_2H_4

$$\begin{array}{cc} \overset{..}{H} & \overset{..}{H} \\ C::C \\ \overset{..}{H} & \overset{..}{H} \end{array}$$
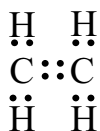
b) Methanol - Molecular formula - CH_3OH

$$\begin{array}{c} \overset{..}{H} \\ H:C:O:H \\ \overset{..}{H} \end{array}$$

3) Heat energy is being produced in a resistance in a circuit at the rate of 100 W. The current of 3 A is flowing in the circuit. What must be the value of the resistance?
Ans : Given I = 3A
        P = 100 W
  To find R = ?
  Formula : $P = I^2R$
  Solution : $P = I^2R$
        $100 = 3^2 \times R$
        $100 = 9R$

$$R = \frac{100}{9}$$

$$R = 11.11 \, \Omega$$

4) Define :
Ans : a) Oxidation reaction : The reaction in which a reactant combines with oxygen or loses hydrogen to form the product is known as oxidation reaction.
    b) Rancidity : Oxidation of fats and oils in food causes unpleasant smell and a change in taste. As a result they become highly rancid and the phenomenon is called

rancidity.

5) Observe the diagram and answer the following :
a) Label A and B in the diagram
Ans : A - Cornea, B - ciliary muscles
b) Explain the function of A
Ans : Maximum refraction of light occurs on the cornea.

Q. 3 Answer the following : (*any* FIVE) 15

1) An object thrown vertically upwards reaches a height of 500 m. What was its initial velocity? How long will the object take to come back to the earth? Assume $g = 10$ m/s^2

Ans : Given: Height (5) = 500m

$g = 10$m/s^2

Acceleration (a) = -g = -10m/s^2

To find: Initial velocity (v)

Time taken for the object to come back to earth (t)

Solution: For the upward motion of an object

Final velocity (v) = 0 m/s

∴ Using Newton's law of motion we get

$v^2 = u^2 + 2as$

$(0^2) = u^2 + 2(-10)$ x 500

$0 = u^2 + 1000(-10)$

$0 = u^2 - 10000$

$u^2 = 10000$

$u = \sqrt{10000}$ ..... [Taking square root]

Now consider downward motion of the object

Suppose the object takes t seconds to come down

Now the initial velocity of the object is zero

u = 0

Distance travelled by the object (s) = 500 m

As velocity and acceleration are in same direction

∴ $a = g = 10$m/s^2

∴ According to Newton's second law of motion we get.

$s = ut + \dfrac{1}{2}gt^2$

∴ $s = 0 + \dfrac{1}{2}at^2$

∴ $500 = \dfrac{1}{2}$ x 10 x $(t)^2$

∴ $1000 = 10\ t^2$

∴ $t^2 = 100$

∴ $t = 10$ sec ..... [Taking square root]

The object will take 10 sec to reach the ground.

It will take the same time to go up

Thus total time taken = 2 x 10 = 20 sec.

2) Match the columns :

Ans : Reactants   **Products**   **Types of chemical reaction**

a) MgH_2 $\rightarrow$ $Mg + H_2$ Oxidation

b) $2H_2S + SO_2$ $\rightarrow$ $3S + 2H_2O$ Redox

c) $CaO + H_2O$ $\rightarrow$ $Ca(OH)_2 + heat$ Exothermic

3) In reference to the figure, answer the following questions :

a) In which type of a microscope do you find the lens arrangement as shown in the following diagram?

Ans : Compound microscope.

b) Write about the working and the use of this microscope.

Ans : The ray diagram shows the working of compound microscope. A small object to be magnified is placed in front of the objective lens just beyond its principal focus. The objective lens of the compound microscope forms a real inverted and enlarged image of the object. This image acts as an object for the eyepiece, whose position is adjusted so that object lies between optical centre and the focus of eyepiece. The eyepiece forms a final virtual, inverted and highly magnified image. The final image is seen through eyepiece, after adjusting the final image at the least distance vision of 25 cm from the eye.

This microscope is used in laboratories to study minute objects like blood cells, plants and animal cells and minute living beings like bacteria.

4) In reference to the figure, answer the following questions :

a) What does the figure illustrate?

Ans : The figure illustrates the concept of heat exchange between a hot and cold object kept in an insulated box.

b) Explain the temperature changes observed in two objects?

Ans : If heat is exchanged between a hot and cold object, the temperature of the cold object goes on increasing due to gain of energy and the temperature of the hot object goes on decreasing due to loss of energy.

c) Write the principle behind this concept.

Ans : Heat energy lost by the hot object = Heat energy gained by cold object.

5) Observe the given figure and name the following rays :

a) Write the name of ray AB.

Ans : Incident ray.

b) Write the name of ray CD.

Ans : Emergent ray.
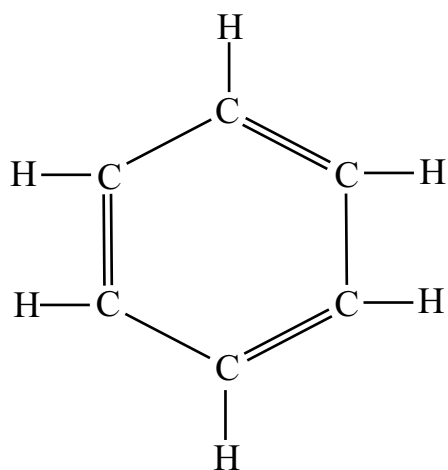
c) State the laws of refraction of light.

Ans : i) The incident ray and the refracted ray are on the opposite sides of the normal at the point of incidence and

ii) All three lie in the same plane.

6) State the molecular formula and structural formula of benzene.

Ans : Molecular formula of benzene : C_6H_6

Structural formula of benzene :

7) Answer the following questions based on the concept of satellites given in the passage.

a) Name a natural satellite of earth.

Ans : Moon is the only natural satellite of the earth.

b) What is artificial satellite? Name the first artificial satellite.

Ans : An artificial satellite is a manmade astronomical object orbiting in a fixed path round the earth or any other planet. The first artificial satellite is 'Sputnik which was sent to space in 1957.

c) What is the purpose of sending such satellites.

Ans : Satellite are launched for different applications related to communication and information gathering. Depending on their function, instruments are installed in the satellite to receive and transmit signals from and to the earth.

8) Observe the following diagram and give answers.

a) Name the method of prevention of corrosion.

Ans : This is anodizing method which is used for the prevention of corrosion.

b) For prevention of which metal this method is used?

Ans : This method is used to prevent corrosion of aluminium and copper.

c) What is used as Anode in this method?

Ans : In this method, copper or aluminium article is used as the anode.

Q. 4 Answer the following : (*any* ONE)   5

1) Observe the figure and write the answers to the questions asked.

a) Construction of which equipment does the diagram show?

Ans : Electric motor

b) On which principle does this equipment work?

Ans : It works on the principle of magnetic effect of electric current.

c) According to which law the coil ABCD rotates?

Ans : Fleming's left hand rule.

d) Write the law in your own words.

Ans : According to this rule, the left hand thumb, index finger, and the middle finger are stretched so as to be perpendicular to each other. If the index finger is in the direction of the magnetic field, and the middle finger points in the direction of the current of

the thumb is the direction of the force on the conductor.

e) Where is this equipment used?

Ans : It is used in fans, refrigerators, mixers, washing machines, computers, pumps, etc.

2) XY Compound formed by X (Atomic number 11) and Y (Atomic number 17) then answer the questions given below.

a) Determine the position of the element X and Y in the modern periodic table.

Ans : Element X is placed in group 1 and period 3

b) Which type of elements X and Y are metals, nonmetals or metalloids?

Ans : Element X is a metal while element Y is a nonmetal.

c) From which block the elements X and Y are?

Ans : Element X belongs to s-block and element Y belongs to p-block.

d) Determine the electronic configuration and valency of these elements.

Ans : Electronic configuration X is (2, 8, 1). Its valency is 1. Electronic configuration of element Y is (2, 8, 7). Its valency is 1.

ಞಬಂಞಬಂ