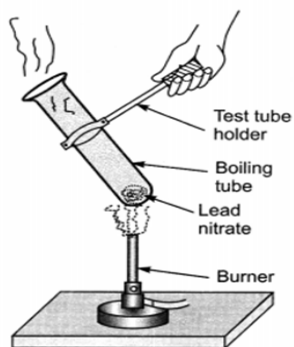


Section-A(Each 1 mark)

Select and write the most appropriate option out of the four options given for each of the questions 1 - 20. There is no negative mark for incorrect response.

1. Observe the following activity and identify the following:



Lead oxide which is ———coloured.

Ans : a) Yellow

2. The arrangement for Copper, Tin, Lead and Mercury according to reactivity series is:

Ans : a) Tin> Lead> Copper> Mercury

3. Which of the following statements is correct about an aqueous solution of an acid and of a base?

- i) Higher the pH, stronger the acid
- ii) Higher the pH, weaker the acid
- iii) Lower the pH, stronger the base
- iv) Lower the pH, weaker the base

Ans : d) (ii) and (iv)

4. The electronic configurations of three elements X, Y and Z are X – 2, 8; Y – 2, 8, 7 and Z – 2, 8, 2.

Which of the following is correct?

Ans : d) Y is a non-metal and Z is a metal.

5. Non-metals form covalent chlorides because

Ans : b) they can share electrons with chlorine

6. Chemical formula of washing soda is

Ans : d) $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$

7. The number of isomers of pentane is

Ans : b) 3

8. Which of the following events in the mouth cavity will be affected if salivary amylase is lacking in the saliva?

Ans : a) Starch breaking down into sugars.

9. A part of the body which responds to the in-structions sent from nervous system is called

Ans : b) effector

10. A feature of reproduction that is common to Amoeba, Yeast and Spirogyra is that

Ans : a) they reproduce asexually

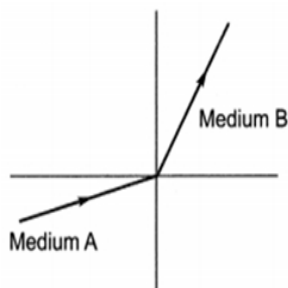
11. Which plant hormone promotes cell division?

Ans : c) Cytokinin

12. What are the products obtained by anaerobic respiration in plants?

Ans : c) Ethanol + carbon dioxide + energy

13. A light ray enters from medium A to medium B as shown in figure. The refractive index of medium B relative to A will be



Ans : a) greater than unity

14. A ray of light is travelling from a rarer medium to a denser medium. While entering the denser medium at the point of incidence, it

Ans : b) bends towards the normal

15. Which statement shows the interaction of an abiotic component with a biotic component in an ecosystem?

Ans : c) An earthworm making a burrow in the soil

16. The manufacturing of Chlorofluorocarbons free refrigerators is mandatory throughout the world.

How does this help prevent ozone depletion?

Ans : d) This will reduce the release of CFCs that reacts with ozone molecules

Question No. 17 to 20 consist of two statements – Assertion (A) and Reason(R). Answer these questions selecting the appropriate option given below:

- a) Both A and R are true, and R is the correct explanation of A.
- b) Both A and R are true, and R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

17. Assertion (A) : Calcium carbonate when heated gives calcium oxide and water. Reason (R) : On heating calcium carbonate, decomposition reaction takes place.

Ans : d) A is false, but R is true

18. Assertion(A): Asexual reproduction is a primitive type of reproduction.

Reason(R): Asexual reproduction involves only mitotic cell division

Ans : a) Both A and R are true, and R is the correct explanation of A.

19. Assertion(A) : On freely suspending a current-carrying solenoid, it comes to rest in N-S direction just like a bar magnet.

Reason (R) : One end of current carrying straight solenoid behaves as a North pole and the other end as a South pole.

Ans : a) Both A and R are true, and R is the correct explanation of A.

20. Assertion(A): Biodegradable substances result in the formation of compost and natural replenishment.

Reason(R): It is due to breakdown of complex inorganic substances into simple organic substances

Ans : c) A is true but R is false.

Section-B (Each 2 marks)

Question No. 21 to 26 are very short answer questions

21. What will be the action of the following substances on litmus paper?

- i) Dry HCl gas
- ii) Moistened NH_3 gas

Ans : i) Dry HCl gas : Dry HCl gas would not affect the litmus paper.

ii) Moistened NH_3 gas: Moistened NH_3 gas is alkaline in nature. Thus it will turn red litmus blue.

22. Name the following:

- i) Thread like non-reproductive structures present in Rhizopus.
- ii) 'Blobs' that develop at the tips of the non-reproductive threads in Rhizopus.

Ans : i) Threadlike non-reproductive structures present in Rhizopus are called hyphae.

ii) 'Blobs' developing at the tip of non-reproductive threads in rhizopus are called sporangia which in spores.

23. a) What is peristaltic movement?

b) 'Stomata remain closed in desert plants during daytime'. How do they do photosynthesis?

Ans : a) The relaxation of gut muscles to move the partially digested food down wards through out the alimentary canal is called peristaltic movement.

b) In desert plants, stomata open at night and take in carbon dioxide (CO_2). Stomata remain closed during daytime to prevent the loss of water by transpiration. They store the CO_2 in their cells until the sun comes out so that they can carry on with photosynthesis during the daytime.

OR

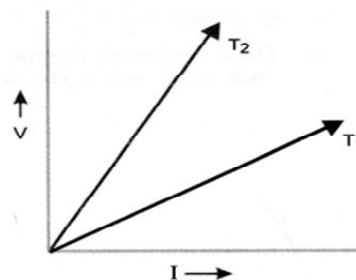
: Describe "blood circulation" in human beings.

Ans : Deoxygenated blood from the body tissues is poured into right atrium. Contraction of heart forces it into right ventricle. From right ventricle, deoxygenated blood flows to the lungs through pulmonary artery. Oxygenated blood from lungs is returned into left atrium and then into left ventricle. The left ventricle forces the oxygenated blood to the whole body. Thus, for making one complete round or circulation circuit around all body parts, the blood passes through the heart twice. This is known as double circulation of blood.

24. A convex lens of focal length 20 cm can produce a magnified virtual as well as real image. Is this a correct statement? If yes, where shall the object be placed in each case for obtaining these images?

Ans : Yes, it is correct. If the object is placed within 20 cm from the lens in the first case and between 20 cm and 40 cm in the second case.

25. The voltage – current (V-I) graph of a metallic circuit at two different temperature T_1 and T_2 is shown. Which of the two temperatures is higher and why?



Ans : Slope of I-V graph = resistance of metallic conductor. Since, slope of I-V graph at temperature T_2 is greater than the slope of I-V graph at temperature T_1 , therefore, resistance at T_2 is greater than resistance at T_1 . Since, resistance of a metallic conductor increases with increase in temperature, therefore, $T_2 > T_1$.

OR

A current carrying conductor is placed perpendicular to the uniform magnetic field. What happens to displacement of the conductor if

- strength of current increases
- If horse shoe magnet is replaced by a weak horse shoe magnet.

Ans : The displacement of the conductor

- will increase on increasing the current
- Will decrease on using a weak horse shoe magnet

26. What is overloading? How can you avoid overloading?

Ans : Overloading means large amount of current flows in the circuit. It can happen when many electrical appliances of high power ratings are connected in a single socket. It can be avoided by the following methods:

- Not use too many appliance in a single socket
- To apply preventive methods of short circuiting.

Section-C (Each 3 Marks)

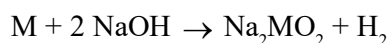
Question No. 27 to 33 are short answer questions

27. Iqbal treated a lustrous, divalent element M with sodium hydroxide. He observed the formation of bubbles

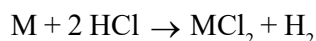
in the reaction mixture. He made the same observations when this element was treated with hydrochloric acid. Suggest how can he identify the produced gas. Write chemical equations for both reactions.

Ans : The gas that is liberated is hydrogen gas. To check the presence of hydrogen gas, we can bring a burning matchstick near the evolved gas if the matchstick burns with a pop sound. It confirms the evolution of hydrogen gas.

Reaction with NaOH:



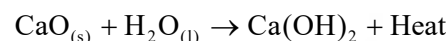
Reaction with HCl:



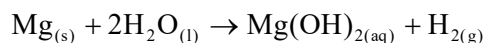
28. a) A substance X, an oxide of a metal, is used extensively in the cement industry. This element is found in our bones also. On treatment with water it forms a solution which turns red litmus blue. Identify X and also write the chemical reaction involved.

b) Choose a metal from the following metals which reacts only with hot water: Sodium, magnesium, iron. Mention the products formed during the reaction.

Ans : a) 'X' is Calcium oxide (CaO). Calcium oxide reacts vigorously with water to form Calcium hydroxide (slaked lime)



b) Magnesium reacts with hot water to form Magnesium hydroxide and hydrogen.

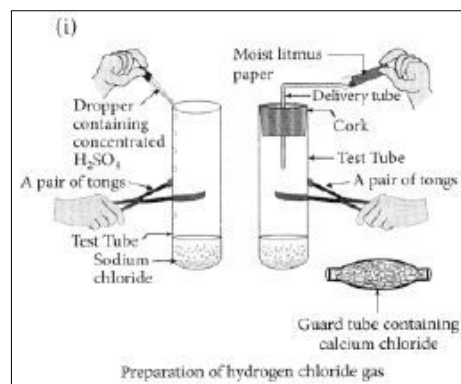


OR

i) Draw a labelled diagram to show the preparation of hydrogen chloride gas in laboratory.

ii) Test the gas evolved first with dry and then with wet litmus paper. In which of the two cases, does the litmus paper show change in colour?

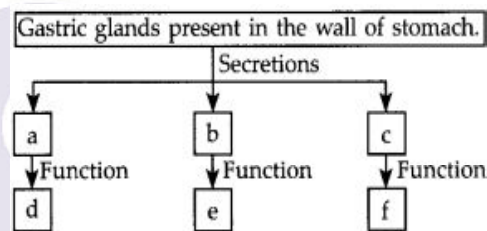
Ans :



ii) There is no change in the colour of 'dry' blue litmus paper but 'moist' blue litmus paper turns red if brought near the mouth of the test tube.

This shows that HCl gas does not show acidic behaviour in absence of water but it shows acidic behaviour in presence of water.

29. Complete the following flow chart as per the given instructions.



Ans : a – Hydrochloric acid (HCl)
 b – Protein digesting enzyme pepsin
 c – Mucus
 d – HCl makes medium acidic for the activation of an enzyme pepsin.
 e – Pepsin acts in acidic medium which breaks down proteins into peptones.
 f – Mucus protects the inner lining of stomach from corroding action of HCl.

30. State the importance of chromosomal difference between sperms and eggs of humans.

Ans : A male has one X chromosome and one Y chromosome. Thus half the sperms will have X chromosomes and the other half will have Y chromosome.

A female has two X chromosomes. So all the female gametes will have only X chromosomes.

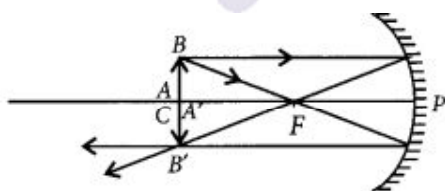
If a sperm carrying X chromosome fertilizes an ovum then the child born will be a girl. If a sperm carrying Y chromosome fertilizes an ovum then the child born will be a boy.

Thus the chromosomal difference between sperms and eggs of humans determines the sex of the child.

31. The linear magnification produced by a spherical mirror is -1. Analysing this value state the (i) type of mirror and (ii) position of the object with respect to the pole of the mirror.

Draw any diagram to justify your answer.

- Ans :** i) Concave mirror because the image is real, inverted.
ii) Object is placed at C.



32. A copper wire has diameter 0.5 mm and resistivity $1.6 \times 10^{-8} \Omega \text{ m}$.

Calculate the length of this wire to make it resistance 100 Ω . How much does the resistance change if the diameter is doubled without changing its length?

- Ans :** Given; resistivity of copper = $1.6 \times 10^{-8} \Omega \text{ m}$, diameter of wire, $d = 0.5 \text{ mm}$ and resistance of wire, $R = 100 \Omega$

$$\text{Radius of wire, } r = \frac{d}{2} = \frac{0.5}{2} \text{ mm}$$

$$= 0.25 \text{ mm} = 2.5 \times 10^{-4} \text{ m}$$

$$\text{Area of cross-section of wire, } A = \pi r^2$$

$$\begin{aligned} \therefore A &= 3.14 \times (2.5 \times 10^{-4})^2 \\ &= 1.9625 \times 10^{-7} \text{ m}^2 \\ &= 1.9 \times 10^{-7} \text{ m}^2 \end{aligned}$$

$$\text{As, } R = \rho \frac{l}{A}$$

$$\therefore 100 = \frac{1.6 \times 10^{-8} \times l}{1.9 \times 10^{-7}}$$

$$l = 1200 \text{ m}$$

If diameter is doubled ($d' = 2d$), then the area of cross-section of wire will become

$$A' = \pi r'^2 = \pi \left(\frac{d'}{2}\right)^2 = \pi \left(\frac{2d}{2}\right)^2 = 4A$$

Now $R \propto \frac{1}{A}$, so the resistance will decrease

by four times or new resistance will be

$$R' = \frac{R}{4} = \frac{100}{4} = 25 \Omega$$

33. List the advantages of connecting electrical devices in parallel with an electrical source instead of connecting them in series.

- Ans :** a) When a number of electrical devices are connected in parallel, each device gets the same potential difference as provided by the battery and it keeps on working even if other devices fail. This is not so in case the devices are connected in series because when one device fails, the circuit is broken and all devices stop working.
b) Parallel circuit is helpful when each device has different resistance and requires different current for its operation as in this case the current divides itself through different devices. This is not so in series circuit where same current flows through all the devices, irrespective of their resistances.

Section-D(Each 5 Marks)

Question No. 34 to 36 are long answer questions.

34. a) What is meant by corrosion? Name any two methods used for the prevention of corrosion.

b) Suppose you have to extract metal M from its enriched sulphide ore.

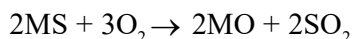
If M is in the middle of the reactivity series, write various steps used in extracting this metal.

- Ans :** a) Corrosion is a process in which metal reacts with substances present in the environment to form surface compounds.

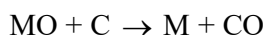
Prevention:

- i) Galvanisation is a process to prevent corrosion of iron.
 ii) Electroplating is also used to prevent corrosion.

- b) i) Concentration of ores: Sulphide ore will be concentrated by froth floatation process. Sulphide ore will be collected in froth whereas gangue will be left behind.
 ii) **Roasting:** Sulphide ore is heated strongly in the presence of O_2 to form metal oxide and sulphur dioxide.



- iii) **Reduction:** MO reacts with carbon (acts as reducing agent) to form metal and CO.



- iv) **Electrolytic refining:** Impure metal 'M' is purified by electrolytic refining. Impure metal is taken as anode, pure metal is taken as cathode, soluble salt of metal is taken as electrolyte. Impure metal forms metal ions which gain electrons and form pure metal at cathode.

OR

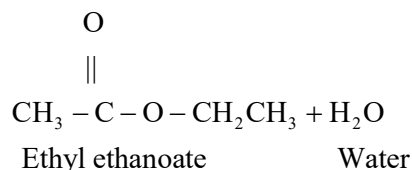
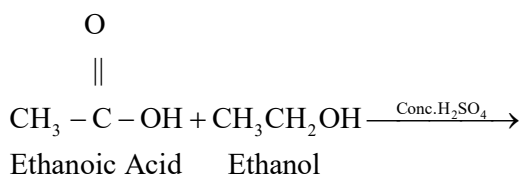
When ethanol reacts with ethanoic acid in the presence of conc. H_2SO_4 , a substance with fruity smell is produced.

Answer the following:

i) State the class of compounds to which the fruity smelling compounds belong. Write the chemical equation for the reaction and write the chemical name of the product formed

ii) State the role of conc. H_2SO_4 in this reaction.

- Ans :** i) When ethanol reacts with ethanoic acid in presence of conc. H_2SO_4 , ethyl ethanoate is formed which belongs to the class of ester compounds, having fruity smell.

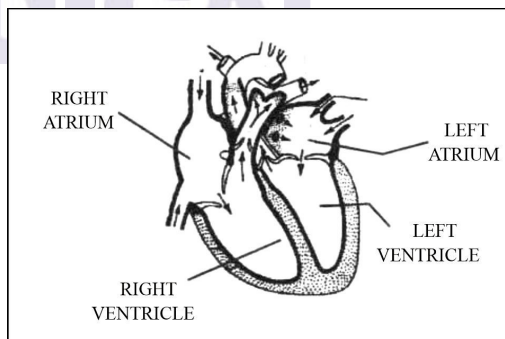


- ii) The above reaction is called esterification which occurs in presence of conc. H_2SO_4 which acts as a dehydrating agent and helps in the removal of water. Conc. H_2SO_4 also acts as a catalyst to speed up the reaction.

35. Draw the diagram of sectional view of human heart and on it name and label the following parts:

- a) The chamber of the heart that pumps out deoxygenated blood.**
b) The blood vessel that carries away oxygenated blood from the heart.
c) The blood vessel that receives deoxygenated blood from the lower part of our body.

- Ans :** a) The chamber of the heart that pumps out deoxygenated blood – Right ventricle
 b) The blood vessel that carries away oxygenated blood from the heart – Aorta
 c) The blood vessel that receives deoxygenated blood from the lower part of our body – Inferior Vena Cava



Internal Structure of Human

OR

On the notice board of ultrasound clinics it is generally stated. "Here prenatal sex determination and disclosure of sex (boy or girl before birth) of fetus is not done. It is prohibited and punishable under law."

- a) List two advantages of imposing ban on prenatal sex determination.
- b) What can students do to educate the society about the following?
- i) The ill-effects of indiscriminate female feticide.
- ii) Adopting small family norms.

Ans :

a) The two advantages of imposing ban on prenatal sex determination are

- check on female feticide
- improving sex ratio in the country.

b) Students should educate the society as that

- female feticide is reducing the number of girls drastically in some societies. For a healthy society, the male-female sex ratio must be maintained at almost the same level. Due to reckless female feticide, the male-female child sex ratio is declining at an alarming rate in some sections of our society.
- Children in a small family can be provided with all the resources from education, good amenities like food, clothing and healthy life style. As the family grows larger, the resources should be shared with increased number of member. Having fewer children also keeps the mother in good health.

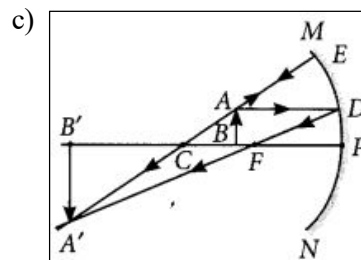
36. A student wants to project the image of a candle flame on the walls of school laboratory by using a mirror.

- a) Which type of mirror should he use and why?
- b) At what distance in terms of focal length 'f' of the mirror should he place the candle flame so as to get the magnified image on the wall?
- c) Draw a ray diagram to show the formation of image in this case.
- d) Can he use this mirror to project a diminished image of the candle flame on the same wall? State 'how' if your answer is 'yes' and 'why not' if your answer is 'no'

Ans : a) He should use concave mirror to get image of candle flame on the walls of

school laboratory. Because concave mirror is a converging mirror and produce real image.

- b) He should place the candle flame in between centre of curvature C and principal focus F of the mirror to get the magnified image on the wall.



- d) Yes, he can use concave mirror to project a diminished image of the candle flame on the same wall. He has to place the candle flame beyond centre of curvature to get diminished image.

OR

Rishi went to a palmist to show his palm. The palmist used a special lens for this purpose.

- i) State the nature of the lens and reason for its use.
- ii) Where should the palmist place/ hold the lens so as to have a real and magnified image of an object?
- iii) If the focal length of this lens is 10 cm, the lens is held at a distance of 5 cm from the palm, use lens formula to find the position and size of the image.

Ans :

i) The lens used here is a convex lens and it is used as a magnifying glass because at close range, i.e., when the object is placed between optic centre and principal focus it forms an enlarged, virtual and erect image of the object.

ii) When this lens is placed such that the object is between the centre of curvature and the principal focus, the palmist obtain a real and magnified image.

iii) Given focal length, $f = 10$ cm and $u = -5$ cm

According to lens formula,

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \quad \text{or} \quad \frac{1}{v} = \frac{1}{f} + \frac{1}{u}$$

or $\frac{1}{v} = \frac{1}{10} + \frac{1}{-5} = \frac{-5+10}{-50}$

$\therefore v = \frac{-50}{5} = -10 \text{ cm}$

Thus, the image will be formed at 10 cm on the same side of the palm and the size of the image will be enlarged.

SECTION - E (Each 4 marks)

Question No. 37 to 39 are case-based/data-based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

37. Read the following paragraph and answer the following question

The reaction between carbon dioxide..... are acidic in nature.

i) What is the nature of Carbon dioxide?

Ans : It is a non-metallic oxide as carbon belongs to non-metals group i.e P-Block elements group 6.

ii) Give another reaction of non-metallic oxide and a base?

Ans : $\text{CO}_2(\text{g}) + 2\text{NaOH}(\text{aq}) \rightarrow \text{Na}_2\text{CO}_3(\text{aq}) + \text{H}_2\text{O}(\text{aq})$

iii) Arrange the following bases in increasing order: NaOH, Ca(OH)₂ & Mg(OH)₂.

Ans : $\text{Mg}(\text{OH})_2 < \text{Ca}(\text{OH})_2 < \text{NaOH}$.

OR

Write the complete reaction between calcium hydroxide and carbon dioxide with physical states?

Ans : $\text{Ca}(\text{OH})_2(\text{aq}) + \text{CO}_2(\text{g}) \rightarrow \text{CaCO}_3(\text{s}) + \text{H}_2\text{O}(\text{l})$

38. Read the following paragraph and answer the following question

We also think about our actions. actions based on that thinking.

i) What are the three major parts of the brain? 1

Ans : Forebrain, Midbrain and hindbrain.

ii) Which fluid is present in our brain?

1

Ans : Cerebrospinal fluid.

iii) What are the function of medulla?

2

Ans : It controls all the involuntary action such as blood pressure, salivation, vomiting, etc.

OR

What is the function of hypothalamus?

Ans : It regulates homeostasis, releases hormones.

39. Read the following paragraph and answer the following question

The domestic electriceach appliance will be same.

i) What are the signs of live wire and neutral wire? 1

Ans : The red insulated wire is the live wire or positive and the black insulated wire is the neutral wire or negative.

ii) In our country what is the potential difference between live wire and neutral wire?

Ans : In our country the potential difference between live wire and neutral wire is 220 V.

iii) What is short circuiting? 2

Ans : When live wire and neutral wire comes in direct contact, in that situation the current through the circuit increases suddenly and it is called as short circuiting.

OR

What is the main purpose of using fuse in electric circuit?

Ans : Because of Joule's heating effect the heat produced causes the fuse to melt and to break the circuit. And thereby protect the circuit and electric appliances.

* * *