Sample Paper
Class 10 CBSE 2020-21

Time: 3 hrs **Max. Marks: 80**

General Instructions

(i) The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.

(ii) (Section–A - question no. 1 to 20 - all questions and parts thereof are of one mark each. These questions contain multiple choice questions (MCQs), very short answer questions and assertion - reason type questions. Answers to these should be given in one word or one sentence.

(iii) Section–B - question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should in the range of 30 to 50 words.

(iv) Section–C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should in the range of 50 to 80 words.

(v) Section–D – question no. - 34 to 36 are long answer type questions carrying 5 marks each. Answer to these questions should be in the range of 80 to 120 words.

(vi) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

(vii) Wherever necessary, neat and properly labelled diagrams should be drawn.

Section – A

1. What is the difference in the molecular formula of any two consecutive members of a homologous series of organic compounds?

   (OR)

   What is the chemical formula for plaster of Paris?

2. When hydrogen sulphide gas is passed through a blue solution of copper sulphates, black precipitate is obtained and the sulphuric acid so formed remains in the solution. The reaction is an example of a:

   A. Displacement reaction

   B. Decomposition reaction

   C. Combination reaction

   D. Double displacement reaction

3. An object is placed at a distance of 40 cm in front of a concave mirror of focal length 20 cm. The image produced is:

   A. virtual and inverted

   B. real and erect

   C. real, inverted and diminished

   D. real, inverted and of same size

4. State any two properties of magnetic field lines.

5. Write true or false for the following statements:

   Convex mirror can be used to see large image of small object.

6. Name the defect of vision which makes the eye-lens cloudy resulting in blurred vision.

   OR

   A ray of light travelling in glass emerges into air. State whether it will bend towards the normal or away from the normal.

7. What kind of mirror is required for obtaining a virtual image of the same size as the object?

8. What is the:

   (a) far point of a normal human eye?

   (b) near point of a normal human eye?

9. How much work is done in moving a charge of 2 C across two points having a potential difference of 12 V?

OR

What is the shape of the current-carrying conductor whose magnetic field pattern resembles that of a bar magnet?

10. A zygote which has an X-chromosome inherited from the father will develop into a:

A. boy

B. girl

C. X-chromosome does not determine the sex of a child

D. either boy or girl

11. Name the largest oxygenated blood carrying blood vessel in the human body.

(OR)

Name the smallest blood carrying vessel in the body.

12. The structural and functional unit of excretion in the human body is known as _____.

(OR)

The Bile is stored in the _____.

A. Liver

B. Gallbladder

C. Pancreas

D. Small intestine

13. Name the end product of respiration of a glucose molecule in the cytoplasm of the human cheek cell.

14. Assertion: Blue colour of sky appears due to scattering of blue colour.

Reason: Blue colour has the shortest wavelength in visible spectrum.

A. Both assertion and reason are true and the reason is the correct explanation of the assertion.

B. Both assertion and reason are true but reason is not the correct explanation of the assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

15. A and R in the given question:

A statement of Assertion (A) is followed by a statement of Reason (R).

Assertion (A)- Carbon cannot reduce the oxides of Na or Mg.

Reason (R)- Na and Mg are highly reactive.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is incorrect explanation of A

C. A is true but R is false

D. Both A and R are false

16. A statement of Assertion (A) is followed by a statement of Reason (R).

Assertion (A)- Asexual mode of reproduction yields progenies at a faster pace than sexual reproduction.

Reason (R)- Sexual reproduction involves several complex events.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is incorrect explanation of A

C. A is true but R is false

D. Both A and R are false

17. Read the following and answer any four questions from 17 (i) to 17 (v)

As the lining of the alimentary canal is soft, the food is also wetted to make its passage smooth. When we eat something we like, our mouth 'waters'. This is actually not only water, but a fluid called saliva secreted by the salivary glands. Another aspect of the food we ingest is its complex nature. If it is to be absorbed from the alimentary canal, it has to be broken into smaller molecules.

17 (i) Complex carbohydrate in the bolus is first degraded by

A. Ptyalin

B. Pancreatic Amylase

C. Gastric Lipase

D. Trypsinogen

17. (ii) Proteins are broken down into smaller units by

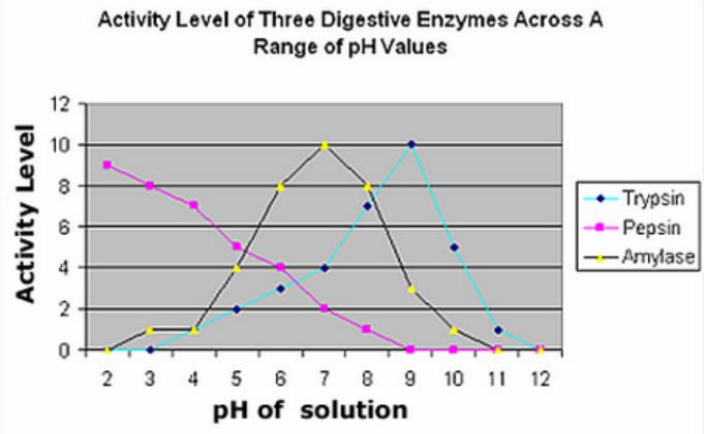
A. Lipase

B. Pepsin

C. Insulin

D. Both B and C

17 (iii) The graph illustrates the activity level of three common digestive enzymes, across a range of pH values. Which enzyme is likely to be active in the acidic environment of the stomach?



A. Pepsin

B. Trypsin

C. Amylase

D. Pepsin and Trypsin

17 (iv) The lacteals present in the villi help in the absorption and transport of:

A. Proteins

B. Fats

C. Carbohydrates

D. Nucleic acids

17 (v) What is absorbed in the large intestine?

A. Water

B. Proteins

C. Fats

D. Carbohydrates

18. Read the following and answer any four questions from 18 (i) to 18 (v)

The physical properties of the various members of a homologous series change regularly with an increase in the molecular mass. Melting and

boiling points of hydrocarbons in a homologous series increase with an increase in molecular mass. The compound containing a larger number of carbon atoms will have higher melting and boiling points. Hydrocarbons containing a lesser number of carbon atoms are gases and large numbers of carbon atoms are solids while hydrocarbons containing intermediate numbers of carbon atoms are liquids.

(i) Arrange the following alcohols in the order of increasing boiling points: Ethanol C_2H_5OH, Propanol C_3H_7OH, Methanol CH_3OH and butanol C_4H_9OH

(ii) What would be the state of hydrocarbon containing 1-4 carbon atoms?

(iii) Calculate the difference in the formulae and molecular masses for CH_3OH and C_2H_5OH.

(iv) Melting point and boiling points of hydrocarbon in a homologous series _____ with _____ in molecular mass

A. Increase, decrease

B. Decrease, increase

C. Increase, increase

D. Remain same, increase

(v) Hydrocarbons containing 5-13 carbon atom are _____ and more than 14 carbon atoms are _____

A. Liquid, solid

B. Solid, liquid

C. Gas, liquid

D. Liquid, solid

19. Read the following and answer any four questions from 19 (i) to 19 (v)

Corrosion is the slow destruction of metals due to their interaction with the environment. It takes pace on the exposed surface. When the upper layer gets corroded, then the inner surface of the metal gets exposed. It needs oxygen and moisture to take place. It is accelerated by the presence of electrolytes in water. Iron gets coated with a brittle brown coloured layer. Copper and brass get a green coloured deposit on their surfaces. Corrosion can be prevented by coating the surface with paint, oil or grease.

(i) Under what conditions does corrosion take place?

(ii) Complete the sentence given below

Presence of _____ in water accelerates the corrosion.

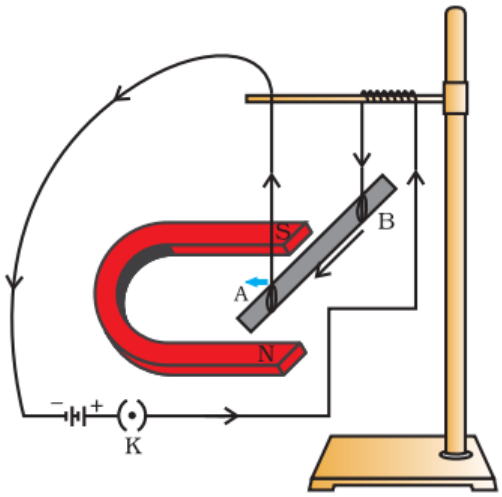
(iii) What do you understand by corrosion?

(iv) Which colour of layer gets deposited on the surface of copper during corrosion?

(v) How can you prevent corrosion?

20. Answer question numbers 20(i) - 20(iv) on the basis of your understanding of the following paragraph and the related studied concepts.

Whenever a current carrying conductor is placed in a magnetic field as shown in the figure below, it experiences a magnetic force. This happens because the current in the conductor has its own magnetic field and there is also a magnetic field present. So both the field will interact and will result in repulsion or attraction of the conductor wire toward the fixed magnets.



The displacement of the rod in the above activity suggests that a force is exerted on the current-carrying aluminum rod when it is placed in a magnetic field. Once the direction of field is changed to vertically downwards by interchanging the two poles of the magnet. The rod tends to move in the opposite direction. It shows that the direction of the force on the conductor depends upon the direction of current and the direction of the magnetic field.

20 (i) State the rule to determine the direction of the force exerted on the aluminum rod shown in the figure below.

20 (ii) In the figure shown in the question, in which direction the rod will move if the direction of the current is reversed (from B → A to A → B)?

20 (iii) State whether the following statement is true or false:

The magnitude of the force acting on the rod is independent of the value of current flowing through it.

20 (iv) In which case the magnetic force acting on the rod will be zero?

20 (v) Name one of the applications of Fleming's left hand rule.

Section-B

21. What is peristalsis?

(OR)

Differentiate between an autotrophic and a heterotrophic organism.

22. Name the organ in humans which produces - (i) male germ cell (ii) female germ cell

23. Write the general chemical reactions for the reaction of acids with

    1. Metals
    2. Metal carbonates

(OR)

What is the 'pH' of pure water and that of rain water? Elaborate it

24. A 9 Ω resistance is cut into three equal parts and connected in parallel. Find the equivalent resistance of the combination.

25. Explain why, if we look at objects through the hot air over a fire, the objects appear to be moving (or shaking) slightly. (2)

26. What is meant by power of a lens? Name and define its S.I. unit.

    One student uses a lens of focal length +50 cm and another of –50cm. State the nature and find the power of each lens. Which of the two lenses will always give a virtual, erect and diminished image irrespective of the position of the object?

Section-C

27. In a bisexual flower in spite of the young stamens being removed artificially, the flower produces fruit. Provide a suitable explanation for the above situation.

(OR)

Why are crop fields known as artificial ecosystems?

28. Why is a plastic bag called non-biodegradable while the paper is not?

29. Give two reasons for the appearance of variations among the progeny formed by sexual reproduction.

30. (a) State the periodic law on which Mendeleev's periodic table was based. Why and how was this periodic law changed ?

(b) Explain why, the noble gases are placed in a separate group.

31. What happens when an aqueous solution of sodium sulphate reacts with an aqueous solution of barium chloride?

(b) State the physical conditions of reactants in which the reaction between them will not take place.

(c) Write the balanced chemical equation for the reaction and name the type of reaction.

32. What is a homologous series? Which two of the following organic compounds belong to the same homologous?

CH_3, C_2H_6, C_2H_6O, $C_2H_6O_2$, CH_4O

33. (a) What is meant by a magnetic field?

(b) How is the direction of the magnetic field at a point determined?

(c) What is the direction of the magnetic field at the centre of a current carrying circular loop? (1+1+1)

Section-D

34. Indicate the flow of energy in an ecosystem. Why is it unidirectional? Justify.

(OR)

In the following crosses write the characteristics of the progeny

a) RRYY x RRYY (round yellow x round yellow)

b) RrYy x RrYy (round yellow x round yellow)

c) rryy x rryy (wrinkled green x wrinkled green)

d) RRYY x rryy (round yellow x wrinkled green)

35. Balance the following equations:

a) $Ca(OH)_2 + H_3PO_4 \longrightarrow H_2O + Ca_3(PO_4)_2$

b) $Na_2O_2 + H_2O \longrightarrow NaOH + O_2$

c) $BF_3 + H_2O \longrightarrow HF + H_3BO_3$

d) $NH_3 + CuO \longrightarrow Cu + N_2 + H_2O$

e) $Cr + O_2 \longrightarrow Cr_2O_3$

36. A. In a household electric circuit, different appliances are connected in parallel to one another. Give two reasons. An electrician puts a fuse of rating 5A in that part of domestic electrical circuit in which an electrical heater of rating 1.5 kW, 220V is operating. What is likely to happen in this case and why? What change, if any, needs to be made? (2.5)

B. Bulb is rated at 200 V, 100 W. Calculate its resistance. Five such bulbs are lighted for 4 hours daily. Calculate the units of electrical energy consumed per day. What would be the cost of using these bulbs per day at the rate of Rs. 4.00 per unit? (2.5)

OR

(a) What is a rainbow? What are the two conditions necessary for the formation of a rainbow in the sky?

(b) Why do you not see a spectrum of colours when light passes through a flat pane of glass?

(c) Explain why the planets do not twinkle at night.

Hints & Solutions

Section – A

1. Answer:—CH_2— is the difference in the molecular formula of any two consecutive members of a homologous series of organic compounds.

   (OR)

   Chemical formula for plaster of Paris is $CaSO_4.1/2\ H_2O$

2. Answer: C

   Solution: When hydrogen sulphide gas is passed through a blue solution of copper sulphate, a black precipitate of copper sulphate is obtained and the sulphuric acid so formed remains in the solution. The reaction is an example of Combination Reaction.

3. Answer: D

   Solution: The radius of curvature of the mirror is double the focal length (R = 2f). The image formed at the centre of curvature of the concave mirror is real, inverted and of the same size.

   For the given mirror, the center The object distance is equal to the centre of curvature of the concave mirror.

4. Answer: The two properties of magnetic field lines are:

   (a) the field lines start with the north pole of the magnet and ends at the south pole of the very same.

   (b) the closer the field lines will be the stronger will be the magnetic field.

5. Answer: False

   A convex always produces a diminished image of the object. It can never produce an image larger than the size of the object.

6. Answer: Cataract; the defect of vision which makes the eye-lens cloudy resulting in blurred vision

   OR

   Answer: A ray of light travelling in glass emerges into air. The ray of light will bend away from the normal.

7. Answer: Plane mirror is required for obtaining a virtual image of the same size as the object

8. Answer: (a) The far point of a normal human eye is at infinity.

   (b) The near point of a normal human eye is at 25cm from the eye.

9. Answer: Given, charge = 2 C

   Potential difference between two points = 12V

   Work done (W) = ?

   We know that;

$$V = \frac{W}{Q}$$

   Or, W = V × Q

   Or, W = 12 V × 2 C = 24 J

OR

   Answer:

   A current carrying conductor is of solenoid shape whose magnetic field pattern seems to that of the bar magnet.

10. Answer: B

    Solution: In humans, the sex of the child is determined by the sex chromosomes inherited from parents. As females are XX, the mother can contribute only an X chromosome to the child. The males are XY and thus the father can contribute either an X or a Y chromosome. If an X chromosome is inherited from the father, the resultant child is a female.

11. Answer: Aorta

(OR)

    Answer: Capillary

12. Answer: Nephron

(OR)

    Answer: B

    Solution: The Bile is secreted by the Liver and stored in the gallbladder.

13. Answer: 2 Pyruvate molecules and 2 ATP molecules.

14. Answer: A

Solution: The smallest wavelength of blue colour it is scattered to large extent than other colours, so the sky appears blue.

15. Answer: A

Solution: Carbon cannot reduce the oxides of Na or Mg because Na and Mg are highly reactive metals and their cations are very stable.

16. Answer: A

Solution: Sexual reproduction involves formation of gametes, their meeting, formation of zygote and further development of it into an embryo. This will develop into a young one which will, after a long time, develop into a reproducing adult. These complex steps are not present in Asexual reproduction. Hence, sexual reproduction is a time-taking process. Whereas, in asexual reproduction, such a case does not happen and the parental cell divides on its own through cell divisions. Hence, Asexual reproduction is a rather quick or swift pace Hence, the answer is option A.

17. (i) Answer: A

Solution: Ptyalin is the salivary amylase found in the saliva of animals. It helps in degradation of starch into smaller subunits. Bolus is the form of food prepared after chewing and mixing of saliva in food.

(ii) Answer: B

Solution: Pepsin is the protein-degrading enzyme produced by the glands in the stomach. Lipase acts on the fats, while the insulin acts on glucose uptake by the cells.

(iii) Answer: A

Solution: Pepsin is an enzyme which helps in the digestion of proteins. It is present in the stomach. Optimum pH range of pepsin for the activity in the stomach is around 1.5-1.6. Trypsin is secreted by the pancreas and amylase is present in saliva and the pancreatic juice.

From the graph, the activity of pepsin decreases as we increase the pH of the solution. Hence, it can be concluded that pepsin is active in an acidic environment.

(iv) Answer: B

Solution: Lacteals help in absorption of emulsified fats from the small intestine, in the form of chylomicrons and it is transported to the different parts of the body.

(v) Answer: A

Solution: Most of the macronutrients are absorbed in the small intestine itself. In the large intestine, only water and some salts are absorbed.

18. (i) Answer: The arrangement in order of increasing boiling points: Methanol < Ethanol < Propanol < butanol

    (ii) Answer: Hydrocarbons containing 1-4 carbon atoms are gases.

    (iii) Answer: Increase of one carbon in the chain, the formula shows an increase of $-CH_2$ unit and the molecular mass increases by 14 units.

    (iv) Answer: (C) Melting points and boiling points of hydrocarbon in a homologous series increase with increase in molecular mass.

    (v) Answer: (A) Hydrocarbons containing 5-13 carbon atoms are liquid and more than 14 carbon atoms are solid.

19. (i) Answer: Corrosion needs oxygen and moisture to take place.

    (ii) Answer: Presence of electrolytes in water accelerates the corrosion

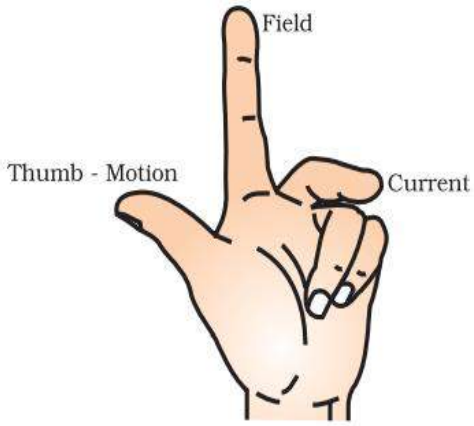
    (iii) Answer: Corrosion is the slow destruction of metals due to their interaction with the environment.

    (iv) Answer: Copper gets a green coloured deposit on the surface during corrosion.

    (v) Answer: Corrosion can be prevented by coating the surface with paint, oil or grease.

20. Answer:

    (i) The direction of the motion of the rod shown in the picture i.e. the direction of the force acting on the conductor is determined using Fleming's **left hand rule**. According to this rule, stretch the thumb, forefinger and middle finger of your left hand such that they are mutually perpendicular as shown in the figure. If the first finger points in the direction of the magnetic field and the second finger in the direction of current, then the thumb will point in the direction of motion or the force acting on the conductor.



(ii) As the direction of the current is reversed; the rod will move in an opposite direction i.e. towards the left hand side as shown in the figure.

(iii) False,

Explanation:

The magnitude of the force acting on the conductor placed in the magnetic field depends on the direction of the current, the value of the current flowing through the conductor and the strength of the magnetic field.

(iv) The strength of the magnetic field depends on the orientation of the conductor in the magnetic field. It experiences no force when the direction of flow of current and the magnetic field is parallel to each other i.e. the angle between the direction of the magnetic field and the current $\theta = 0°$

(v) Flemings left hand rule is used to determine the direction of rotation of the armature in an electric motor.

Section-B

21. Answer: Peristalsis is a series of contraction and relaxation of smooth muscles in a specific manner that helps in the movement of food through the digestive tract.

(OR)

Answer:

Autotroph	Heterotroph
The organism that can use carbon di oxide directly as the carbon source for the production of their food is autotrophs.	Organisms that depended upon other organisms for their carbon requirements are heterotrophs.

22. Answer: (i) Testes; (ii) Ovary

23. Answer:

$$\text{Acid} + \text{Metal} \longrightarrow \text{Salt} + \text{Hydrogen}$$

$$2HCl + 2Na \longrightarrow 2NaCl + H_2$$

$$\text{Acid} + \text{Metal carbonate} \longrightarrow \text{Salt} + \text{Water} + \text{Carbon dioxide}$$

$$2HCl + CaCO_3 \longrightarrow CaCl_2 + H_2O + CO_2$$

(OR)

Answer: pH VALUE OF pure water us 7 i.e it is neither acidic nor basic.

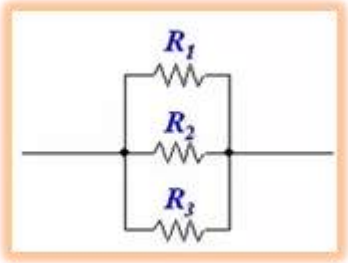
Normal rainwater has a pH of 5.6 (slightly acidic). This is because it is exposed to the carbon dioxide in the atmosphere. The carbon dioxide gets dissolved in the rainwater and forms carbonic acid.

24. Answer: When the wire is cut into three equal parts the length of each part will be l/3.

And resistance is directly proportional to the length.

∴ The resistance of each part will be 9/3 = 3.

Now we have three resistors each of 3Ω connected parallel as shown in figure below.



By formula for resistors in parallel.

$$\frac{1}{R_{eq}} = \frac{1}{3} + \frac{1}{3} + \frac{1}{3}$$

$$\frac{1}{R_{eq}} = \frac{1+1+1}{3} = \frac{3}{3} = 1$$

$\Rightarrow R_{eq} = 1\ \Omega$.

Hence the equivalent resistance of the combination is 1 Ω

25. Answer: When we look at objects through the hot air over a fire, the objects appear to be moving (or shaking) slightly this happens because the air just above the fire becomes hotter. This hotter air is optically rarer but the colder air further up is optically denser, so when we see the objects by the light coming from them through hot and cold air layers having different optical densities, then refraction of light takes place randomly.

26. Answer: Power of lens is defined as the efficiency with which a lens can converge or diverge the light ray.

The reciprocal of focal length of the lens is called the power of the lens (P).

P (in diopter),

$$\frac{1}{f(\text{in meters})}$$

The S.I unit of power of lens is diopter denoted by D.

The student has two lenses with him of focal length 50 cm and – 50 cm.

f_1 = 50cm = 0.5m (1m = 100cm)

$$\Rightarrow P_1 = \frac{1}{f_1} P_1 = \frac{1}{0.5} = 2D$$

Since, power is positive therefore the lens with focal length 50 cm is convex lens, f_2 = -50cm = - 0.5m (1m = 100cm)

$$\Rightarrow P_2 = \frac{1}{f_2} P_2 = \frac{1}{-0.5} P_2 = -2D$$

Since Power is negative therefore the lens with focal length -50cm is concave lens.

The image formed by the concave lens is virtual, erect and diminished irrespective of the position of the object.

Section-C

27. Answer: Bisexual flower consists both stamens (male reproductive part) and carpel (female reproductive part). If in a bisexual flower stamens are removed artificially and carpel remains intact in the flower then, cross-pollination may occur in this flower which may lead to the formation of fruit.

(OR)

Answer: Artificial ecosystems are those ecosystems which are not natural but created by humans or are human-made. Artificial ecosystems are created by human interventions. Crop fields are not grown naturally, instead they are grown by humans. So, crop fields are known as artificial ecosystems and not natural ecosystems.

28. Answer: Plastic bags cannot be broken down by microorganisms. It will remain in the environment for many years. Paper is a biodegradable material made from other natural products like fruits, plants etc. Hence, paper can be degraded naturally by the action of microorganisms in a few months.

29. Answer: Two reasons for the appearance of variations among the progeny formed by sexual reproduction are as follows-

(i) The progeny formed from sexual reproduction involves two parents with different sets of characters.

(ii) The genetic material is exchanged between chromosomes before forming a zygote. Deoxyribonucleic acid (DNA) exchange in the chromosome. This results in the formation of variation in the progeny.

30. Answer: (a) According to Mendeleev's periodic law: The properties of elements are a periodic function of their atomic masses. It was the discovery of atomic numbers which led to a change in Mendeleev's periodic law which was based on atomic mass.

(b) Noble gas is chemically inert or unreactive so they are placed in different groups.

31. Answer: White precipitate of barium Sulphate is formed.

(b) If both reactants are in solid state, then the reaction will not take place between them.

(c)

$$BaCl_2(aq) + Na_2SO_4(aq) \longrightarrow BaSO_4(s) + 2NaCl(aq)$$

It is a double displacement as well as a precipitation reaction.

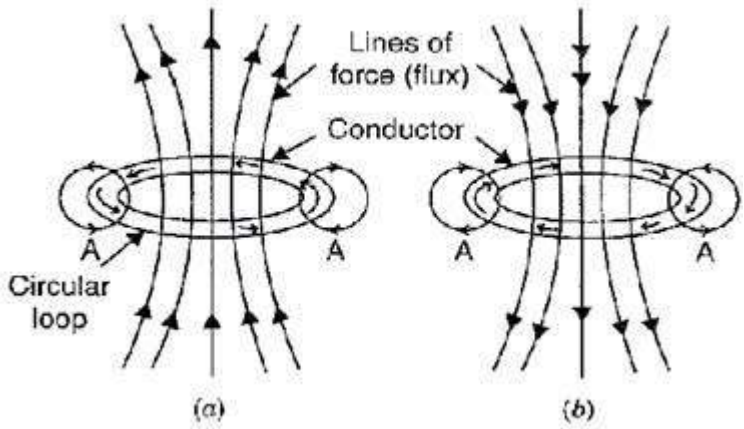
32. Answer: Homologous series is a series of organic compounds which have same functional group and similar chemical properties. Each member of this series differs by $-CH_2-$ in its molecular formula and 14u in its molecular mass.

    C_2H_6O (C_2H_5OH) and CH_4O (CH_3OH) belong to same homologous series.

33. Answer: a) Magnetic field is the area in which the magnetic strength of a magnet can be felt by a magnetic material, inside this field the magnet can either attract or repel the magnetic substances.

    b) We can determine magnetic field direction by using a magnetic compass by placing it at that point and observing the needle's direction.

    c) The direction of the magnetic field depends upon the direction of current passing through that circular loop. If the current is flowing clockwise then the direction of the magnetic field is inside the loop along the axis and vice versa.



Section-D

34. Answer: The energy flow is from one trophic level to another i.e. from producer to primary consumer to secondary consumer to tertiary consumer. The direction of flow of energy is in one direction i.e. it is unidirectional. It is not possible that energy flow occurs in the opposite direction or in reverse direction. For example: a Predator can eat a prey but its reverse is not possible. Moreover, once the energy utilized by the

organisms in the food chain can't be reverted back to the sun. Similarly, the energy once used by carnivores can't be reverted back to herbivores which means that the flow of energy in an ecosystem is unidirectional in the ecosystem.

(OR)

Answer: a) A cross between two pure breeding dominant parents gives pure breeding dominant progeny in F1 generation. All produced progeny will exhibit round and yellow with phenotype (RRYY).

b) A cross between two dihybrid dominant recessive parents, gives phenotypic ratio 9:3:3:1 in progeny. All progeny in this cross will exhibit round yellow (RRYY), Round yellow (RrYy), Round green (RRyy), Round green (Rryy), wrinkled yellow (rrYY), wrinkled yellow (rrYy), wrinkled green (rryy).

c) A cross between two pure breeding recessive parents gives pure breeding recessive progeny in F1 generation. All produced progeny will exhibit wrinkled green with phenotype (rryy).

d) A cross between pure breeding dominant and pure recessive parents, gives heterozygous dominant progeny. All progeny in the cross will have genotype RrYy and exhibit Round yellow.

35. Answer:

a) $3Ca(OH)_2 + 2H_3PO_4 \longrightarrow 6H_2O + Ca_3(PO_4)_2$

b) $2Na_2O_2 + 2H_2O \longrightarrow 4NaOH + O_2$

c) $2BF_3 + 6H_2O \longrightarrow 6HF + 2H_3BO_3$

d) $2NH_3 + 3CuO \longrightarrow 3Cu + N_2 + 3H_2O$

e) $4Cr + 3O_2 \longrightarrow 2Cr_2O_3$

36. Answer:

A. The two reasons for connecting the appliances in parallel are as follows.

1. Each appliance will be at same potential (voltage).

2. If one of the appliances fails the other will still keep working.

Given

Voltage = 220V;

Power = 1.5kW = 1500W

(1kW = 1000W)

Now, the power dissipated is described as,

P = VI

$$I = \frac{P}{V} = \frac{1500}{220} = 6.8$$

The current in the circuit is 6.8A

Since the current in the circuit is more than the rating of the fuse (5A) the fuse will blow off.

A fuse of rating 10 A should be put off in the circuit

B. We know that for an electric appliance

$$P = \frac{V^2}{R}$$

Resistance will be given as

$$R = \frac{V^2}{P}$$

Now, here

P = 100 W; V = 200 volts

So,

$$R = \frac{(200)^2}{100} = \frac{40000}{100} = 400\Omega$$

Thus, resistance of the bulb is R = 400 Ω

Now, electric energy consumed will be

E = power of each unit × time.

⇒ E = p × t.

Here, P = 100 W, t = 4 hours

So,

E = 100 x 4 = 400 Watt per hour

Dividing by 1000 to convert into Kilo Watt per hour

$$E = \frac{400}{1000} = 0.4\ kWh$$

Electrical energy consumed is 0.4 kWh

The total cost of electricity = total unit of energy consumed x cost per unit =

Cost = 0.4kWh x 4 Rs/kWh = Rs 1.6

Thus, total cost (daily) = Rs. 1.6

OR

Answer:

(a) An arch of seven colors visible in the sky which is produced by the dispersion of sun's light by raindrops in the atmosphere is known as rainbow.

The two conditions necessary for the formation of the rainbow are:-

I) The sun should be shining and it should be raining at same time.

II) The sun must be facing the back of the observer.

(b) When light passes through a flat pane of glass, the refracted light emerges out of the glass pane without any deviation because a glass pane has two sides that are parallel to each other.

(c) As the planets are near to earth so they appear big and so they have a collection of many point sources of light. The dimming effect produced by some of the point sources is nullified by brighter effect produced by some other point sources. That is why, the overall brightness remains the same and the planets do not appear to twinkle.

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