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CBSE-X

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SCIENCE
MOCK TEST 03
CBSE-X

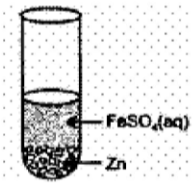
Time Allowed: 3 hours **Maximum Marks: 80**

General Instructions:

1. This question paper consists of 39 questions in 5 sections.
2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
3. Section A consists of 20 objective-type questions carrying 1 mark each.
4. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
5. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
6. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answers to these questions should be in the range of 80 to 120 words.
7. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

Section A

1. On adding zinc granules to freshly prepared ferrous sulphate solution, a student observes that **[1]**



a) a dull brown coating is formed
b) a greyish black coating is formed
c) a white coating is formed
d) no coating is formed

2. Which atom is reduced when any element E is burnt in air? **[1]**

a) Oxygen
b) Nitrogen
c) Argon
d) radon

3. Which of the following compound is/are acidic in nature? **[1]**

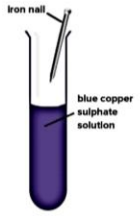
a) C_3H_8
b) $C_{12}H_{22}O_{11}$
c) CH_4
d) C_2H_2

4. The hardness of water is caused by: **[1]**

a) All of these
b) $Mg(HCO_3)_2$

c) $CaCl_2$ d) $CaSO_4$

5. An iron nail is suspended in $CuSO_4$ solution and kept for a while. The solution: **[1]**



a) Turns green and no coating will be formed on the nail.

b) Turns green and a coating will be formed on the nail

c) Remains blue and a coating is found on the nail

d) Remain blue and no coating will be formed on the nail.

6. Generally metals react with acids to give salt and hydrogen gas. Which of the following acids does not give hydrogen gas on reacting with metals (except Mn and Mg)? **[1]**

a) HNO_3 b) H_2SO_4

c) HCl d) All of these

7. IUPAC names of a few esters are given below: **[1]**

i. Ethyl propanoate
ii. Propyl methanoate
iii. Methyl butanoate
iv. Ethyl butanoate

The ester(s) which contain(s) ten hydrogen atoms per molecule is/are

a) (i) and (ii) only b) (iv) only

c) (i) and (iii) only d) i only

8. Under the high power objective of a microscope, an epidermal peel of a leaf shows **[1]**

a) stomata surrounded by several guard cells each

b) stomata surrounded by several epidermal cells

c) stomata surrounding by a pair of guard cells each

d) stomata surrounding many guard cells

9. The principle of inheritance of acquired characters was given by **[1]**

a) Weismann b) Darwin

c) Hugo De Vries d) Lamarck

10. The two phases covering the first half and second half of the menstrual cycle are **[1]**

a) Secretory phase, ovulalion b) Proliferative phase, ovulation

c) None of these d) Proliferative phase, secretory phase

11. Father of Human genetics is **[1]**

a) H.G Khurana b) Sir Archibald Garrod

c) Gregor Mendel d) Charles Darwin

12. During respiration exchange of gases take place in **[1]**

a) alveoli of lungs
b) throat and larynx
c) alveoli and throat
d) trachea and larynx

13. A straight current carrying conductor is kept along the axis of circular loop carrying current. The force exerted by the straight conductor on the loop is **[1]**

a) In the plane of the loop, towards the center
b) Zero
c) In the plane of the loop, away from the center
d) Perpendicular to the plane of the loop

14. An electric kettle for use on a 230 V supply is rated at 3000 W. For safe working, the cable connected to it should be able to carry at least: **[1]**

a) 5 A
b) 15 A
c) 2 A
d) 10 A

15. Which of the following is/are terrestrial ecosystem(s)? **[1]**

A. Forest
B. Aquarium
C. Grassland
D. Desert

a) A, B and D
b) A and D
c) A and B
d) A, C and D

16. Organisms which synthesise carbohydrates from inorganic compounds using radiant energy are called **[1]**

a) Decomposers
b) Carnivores
c) Herbivores
d) Producers

17. **Assertion (A):** $MnO_2 + 4HCl \longrightarrow MnCl_2 + Cl_2 + 2H_2O$, is a redox reaction. **[1]**

Reason (R): MnO_2 oxidises HCl to Cl_2 and gets reduced to $MnCl_2$.

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 not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

18. **Assertion (A):** Internal fertilisation occurs in mammals and birds. **[1]**

Reason (R): External fertilisation occurs in reptiles, amphibians and fishes.

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 not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

19. **Assertion (A):** The strength of the magnetic field produced at the centre of a current-carrying circular coil increases on increasing the current flowing through the coil. **[1]**

Reason (R): Magnetic field strength is inversely proportional to the current flowing in the coil.

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 not the correct explanation of A.

c) A is true but R is false.
d) A is false but R is true.

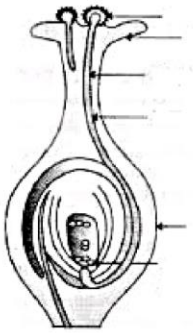
20. **Assertion (A):** Recycling is the way of managing plastic waste. **[1]**
Reason (R): Broken plastic articles are sent to plastic processing units where they are melted and remoulded to make new plastic articles.

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 not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

Section B

21. Explain the oxidation reaction with the examples. **[2]**

22. i. Label the following diagram. **[2]**



ii. Which process in being shown in the diagram?

23. Mention the steps of respiration in higher animals. **[2]**

OR

How would the digestion of proteins and carbohydrates be affected if in the duodenum of man there is a blockade in the pancreatic duct?

24. On the way from Kanpur to Delhi there were four friends. Sunil was driving the car and saw from his side mirror that the car which was behind their car had met an accident. He suddenly applied the brake even after his friends asked him to leave the situation as it is. But Sunil did not agree and get down of car and persuaded his friends to help the injured. All of them took the injured person to the nearest hospital. After taking first aid from hospital the victim thanked and pleased them for saving his life. Read the above passage and answer the following questions: **[2]**

i. Name the type of mirror from which Sunil saw the accident.
ii. Why this mirror is used as a side mirror in vehicles?
iii. What can you learn from the Sunil's character?

25. Distinguish between producers and consumers. **[2]**

OR

Why is improper disposal of waste a curse to environment?

26. Why does the sky appear dark instead of blue to astronaut? **[2]**

Section C

27. A zinc plate was kept in a glass container having copper sulphate solution. On examining it was found that the blue colour of the solution is fading slowly. After a few days when the zinc plate was taken out of the solution, a number of small holes were noticed in it. State the reason and give chemical equation of the reaction involved. **[3]**

28. i. By the transfer of electrons, illustrate the formation of bond in magnesium chloride and identify the ions present in this compound. **[3]**

ii. Ionic compounds are solids. Give reasons.

iii. With the help of a labelled diagram show the experimental set up of action of steam on a metal.

OR

What is the cause of the inertness of noble gas elements?

29. i. Why is nutrition a necessity for an organism? State three reasons. **[3]**

ii. What is likely to happen if green plants disappear from Earth?

30. In human beings blue eye colour is recessive to brown eye colour. A brown eyed man has a blue eyed mother. **[3]**

a. What is the genotype of man and his mother?

b. What are possible genotypes of his father?

c. If man marries a blue eyed woman, what are the possible genotypes of their offsprings?

31. How are the power and focal length of a lens related? You are provided with two lenses of focal length 20 cm and 40 cm respectively. Which lens will you use to obtain more convergent light? **[3]**

32. For a heater, rated 4 kW and 220 V, calculate the following: **[3]**

a. The current

b. Energy consumed in 2 hours

c. If 1 kWh is priced at ₹4.50, then the cost of energy consumed

33. Draw a schematic diagram of a circuit consisting of a battery of three cells of 2 V each, a 5 Ω resistor, an 8 Ω resistor, and a 12 Ω resistor and a plug key, all connected in series. Now, connect the ammeter to measure the current through the resistors and a voltmeter to measure the potential difference across the 12 Ω resistors. What would be the readings in the ammeter and the voltmeter? **[3]**

Section D

34. The solid element A exhibits the property of catenation. It is also present in the form of a gas B in the air which is utilized by plants in photosynthesis. An allotrope C of this element is used in glass cutters. **[5]**

i. What is element A?

ii. What is the gas B?

iii. Name the allotrope C.

iv. State another use of allotrope C (other than in glass cutters).

v. Name another allotrope of element A which exists as spherical molecules.

vi. Name a yet another allotrope of element A which conducts electricity.

OR

Differences between soaps and synthetic detergents.

35. Draw a well labeled diagram of male reproductive system and describe its parts. **[5]**

OR

Explain briefly movements in plants.

36. We wish to obtain an erect image of an object, using a concave mirror of focal length 15 cm. What should be the range of distance of the object from the mirror? What is the nature of the image? Is the image larger or smaller than the object? Draw a ray diagram to show the image formation in this case. **[5]**

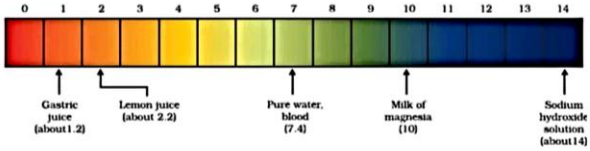
OR

An object 1 cm high is placed on the axis and 15 cm from a concave mirror of focal length 10 cm. Find the position, nature, magnification and size of the image.

Section E

37. **Read the text carefully and answer the questions:** **[4]**

The strength of acid and base depends on the number of H^+ and the number of OH^- respectively. If we take hydrochloric acid and acetic acid of the same concentration, say one molar, then these produce different amounts of hydrogen ions. Acids that give rise to more H^+ ions are said to be strong acids, and acids that give less H^+ ions are said to be weak acids. Can you now say what weak and strong bases are?



(i) Fresh milk has a pH of 6. How do you think the pH will change as it turns into curd?

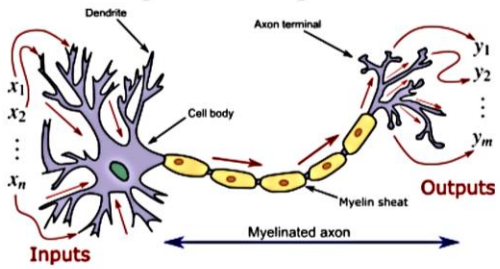
(ii) Is Gastric juice a weak acid?

OR

Milk of magnesia is an acid or base? For what purpose it can be used?

38. **Read the text carefully and answer the questions:** **[4]**

In animals, control and coordination are provided by nervous and muscular tissues. Touching a hot object is an urgent and dangerous situation for us. We need to detect it and respond to it. How do we detect that we are touching a hot object? All information from our environment is detected by the specialised tips of some nerve cells. These receptors are usually located in our sense organs, such as the inner ear, the nose, the tongue, and so on. So gustatory receptors will detect taste while olfactory receptors will detect the smell. This information, acquired at the end of the dendritic tip of a nerve cell, see figure, sets off a chemical reaction that creates an electrical impulse. This impulse travels from the dendrite to the cell body, and then along the axon to its end.



(i) Name the largest cell present in the body.

(ii) What is an axon ?

(iii) Name one gustatory receptor and one olfactory receptor present in a human beings.

OR

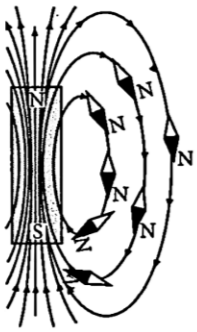
Name the following parts of a neuron:

a. Where information is acquired.

b. Through which information travels as an electrical impulse.

39. **Read the text carefully and answer the questions:** **[4]**

A magnetic field is described by drawing the magnetic field lines. When a small north magnetic pole is placed in the magnetic field created by a magnet, it will experience a force. And if the north pole is free, it will move under the influence of the magnetic field. The path traced by a north magnetic pole free to move under the influence of a magnetic field is called a magnetic field line.

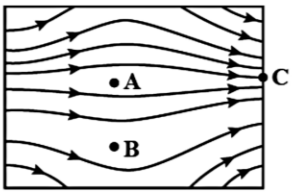


Since the direction of the magnetic field line is the direction of the force on a north pole, so the magnetic field lines always begin from the N-pole of a magnet and end on the S-pole of the magnet. Inside the magnet, however, the direction of magnetic field lines is from the S-pole of the magnet to the N-pole of the magnet. Thus, the magnetic field lines are closed curves. When a small compass is moved along a magnetic field line, the compass needle always sets itself along the line tangential to it. So, a line drawn from the south pole of the compass needle to its north pole indicates the direction of the magnetic field at that point.

(i) Do the magnetic field lines intersect? if not why?

(ii) A strong bar magnet is placed vertically above a horizontal wooden board. What would be the magnetic lines of force?

(iii) The figure shows the magnetic field lines in a magnetic field. A, B., and C are three points in this field. At what point is the magnetic field strength?



OR

Draw the pattern of magnetic field lines for a bar magnet.

SCIENCE Solutions
03
MOCK TEST
CBSE-X

Section A

1. **(b)** a greyish black coating is formed

Explanation: The colour of the coating is grayish black. When Zinc Reacts with ferrous sulphate zinc displaces iron forming zinc sulphate and iron metal is precipitated and settles on the surface of zinc granules. This is because zinc is more electropositive than iron so it can displace iron from its solution. Also, the solution turns colourless from light green.

$$FeSO_4\,(aq) + Zn\,(s) \rightarrow \underset{Black}{ZnSO_4\,(aq)} + Fe\,(s)$$

2. **(a)** Oxygen

Explanation: Oxidation is the process of being oxidized. A substance is said to be oxidized when it loses electrons to the oxidizer or gains oxygen atoms. The oxidizer is the substance that oxidizes. The most common oxidizer is Oxygen. Since it is so abundant, we naturally connote oxygen to be required for burning.

When things burn, they get oxidized. Complex molecules get reduced to simpler ones. For example, wood on combustion will give carbon dioxide and water as its main products.

E is oxidized and oxygen is reduced.

3. **(d)** C_2H_2

Explanation: Triple bonds are the most acidic in nature than other classes of compounds.

4. **(a)** All of these

Explanation: The **hardness of water** is caused by magnesium and calcium salts. Calcium and magnesium dissolved in water are the two most common minerals that make water hard. Temporary hardness is a type of water hardness caused by the presence of dissolved bicarbonate minerals (calcium bicarbonate and magnesium bicarbonate).

5. **(b)** Turns green and a coating will be formed on the nail

Explanation: The solution will turn green due to the formation of iron sulphate. A coating of copper is formed on the nail. Iron is more reactive than copper and displaces it from its solution.

$CuSO_4(aq) + Fe(s) \rightarrow FeSO_4(aq) + Cu(s)$

6. **(a)** HNO_3

Explanation: Hydrogen gas is not evolved when a metal reacts with dilute nitric acid because nitric acid is a strong oxidizing agent. So, as soon as hydrogen gas is formed in the reaction between a metal and dilute nitric acid, the nitric acid oxidizes this hydrogen to water. Very dilute nitric acid, however, reacts with magnesium and manganese to evolve hydrogen gas.

7. **(c)** (i) and (iii) only

Explanation: Ethyl propanoate : $\underset{(10\text{ H atoms})}{CH_3CH_2COOCH_2CH_3}$

Propyl methanoate : $\underset{(8\text{ H atoms})}{HCOOCH_2CH_2CH_3}$

Methyl butanoate : $\underset{(10\text{ H atoms})}{CH_3CH_2CH_2COOCH_3}$

Ethyl butanoate : $\underset{(12\text{ H atoms})}{CH_3CH_2CH_2COOCH_2CH_3}$

8. **(c)** stomata surrounding by a pair of guard cells each

Explanation: Onion peel possesses stomata, guard cells, and epidermal cells. The nuclei are present in both epidermal and guard cells. Stomata is a pore surrounded by guard cells, so it does not possess any nucleus.

9. **(d)** Lamarck

Explanation: Lamarckism - Theory of Inheritance of Acquired Characters is the first theory of evolution, which was proposed

by Jean Baptiste de Lamarck (1744-1829), a French biologist. Although the outline of the theory was brought to notice in 1801, his famous book "Philosophic Zoologique" was published in 1809, in which he discussed his theory in detail.

10. **(d)** Proliferative phase, secretory phase
Explanation: The first phase is the proliferative phase and the second phase is the secretory phase.

11. **(c)** Gregor Mendel
Explanation: Gregor John Mendel is considered as the father of genetics as he laid down the principles or laws of inheritance for the first time. Though his works were based on plants but the laws governing inheritance patterns are also applicable to humans and hence we call them as " Mendel's Laws of Inheritance".

12. **(a)** alveoli of lungs
Explanation: Trachea, Larynx provide a passage for the movement of air. Gas exchange takes place in alveoli of the lungs. From alveoli, oxygen diffuses into the blood, and carbon-di-oxide exhaled out of the blood.

13. **(b)** Zero
Explanation: Magnetic field due to straight current carrying conductor is concentric circles which is parallel to the plane of the loop. Hence, force exerted is zero.

14. **(b)** 15 A
Explanation: 15 A current is required for the safe working of an electric kettle that has a supply of 230 V.

15. **(d)** A, C and D
Explanation: All given ecosystems are terrestrial ecosystems. Forest, grassland and desert are natural ecosystems. An aquarium is an example of a human-made (artificial) ecosystem.

16. **(d)** Producers
Explanation: Producers use solar energy to synthesize food from water and carbon-di-oxide. Plants and few micro-organisms are the producers.
Organisms that decompose organic material are called decomposers.
Herbivores are the organisms that feed on plant and its products.
Carnivore are the ones which feed on other organisms.

17. **(a)** Both A and R are true and R is the correct explanation of A.
Explanation: Both A and R are true and R is the correct explanation of A.

18. **(c)** A is true but R is false.
Explanation: The fertilisation which occurs inside the female body is called internal fertilisation. Reptiles show internal fertilisation.

19. **(c)** A is true but R is false.
Explanation: A is true but R is false.

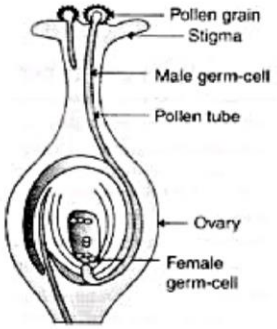
20. **(b)** Both A and R are true but R is not the correct explanation of A.
Explanation: Plastics are non-biodegradable. They cannot be decomposed by the action of microbes. Recycling them can manage them effectively.

Section B

21. When oxygen is added to alcohol to make carboxylic acid, this is called an oxidation reaction. An example of oxidation of alcohol is given as

$$CH_3CH_2CH_2OH \xrightarrow{dil\ KMnO_4/acidfied\ K_2Cr_2O_7} CH_3CH_2COOH$$

22. i.



ii. The diagram show the process of germination of pollen on stigma. Which is necessary for passage of male gametes to ovary. In this the pollen grains develops pollen tube which enters the ovary and releases the 2 male gametes. One of which participate in syngamy and the other in triple fusion.

23. i) Breathing
ii) Exchange of gases
iii) Cell respiration

OR

Duodenum is the region where the pancreatic juice secreted by the pancreas enters. The enzymes pancreatic amylase and trypsin helps in the digestion of carbohydrates and proteins. Thus, if there is a blockade, the digestion of carbohydrates and proteins gets affected.

24. i. The type of mirror used is convex mirror.
ii. Convex mirror is used as a side mirror in vehicles. Convex mirrors have a wider field of view as they are curved outwards. Therefore, convex mirrors enable the driver to view much larger area.
iii. Sunil was a kind and helpful Boy. We learn to help needy people, from Sunil's character

25.

Producers	**Consumers**
(i) They prepare their own food.	(i) They depend on producers for their food.
(ii) They prepare food from inorganic material by the process of photosynthesis.	(ii)They depend on readymade food.
(iii) They always constitute the first trophic level	(iii) They are placed at second or higher trophic levels.
(iv) They possess chlorophyll which helps them in synthesising their own food.	(iv) They do not possess chlorophyll pigments.
(v) They have the capacity to trap solar energy and convert them to chemical energy in the form of carbohydrates. Examples - Green plants, algae etc.	(v) They cannot trap solar energy and convert to chemical energy. They eat producers to get chemical energy. Examples - Humans, other animals like goats, rabbits, lions, tigers etc.

OR

Wastes pollute air, soil and water, and cause harmful effects on all living organisms . If waste is not properly segregated into biodegradable and non-biodegradable it will pollute environment and also, hamper the process of decomposition. If the waste is disposed off near a residential area and is not covered properly, it can create a problem of stench in the surrounding and lead to various health issues.

26. Blue colour of the sky as seen from earth surface is on the account of scattering of light of shorter wavelength by particles present in the atmosphere of the earth. If the earth had no atmosphere, there would not have been any scattering and sky would have looked dark. When an astronaut is in his spacecraft, he is present above the atmosphere of earth, from where the sky appears dark to him because there is no scattering of light there.

Section C

27. Zinc is more reactive than copper. Hence, when a zinc plate is kept in a solution of copper sulphate, it slowly displaces copper from the solution and blue colour of the solution keeps fading away. Because of zinc going into solution as zinc sulphate, a number of holes are seen in the zinc plate. The reaction is

$$\underset{Blue}{CuSO_4(aq)} + Zn(s) \rightarrow \underset{Colourless}{ZnSO_4(aq)} + Cu(s)$$

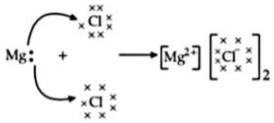
28. i. Formation of magnesium chloride - magnesium is a metal and chlorine is a non-metal. The magnesium atom loses 2 electrons to attain a stable configuration which results in the formation of magnesium cation Mg^{2+}.

Similarly, the chlorine atom gains an electron to complete its octet and results in the formation of chloride anion Cl^-.

When magnesium reacts with chlorine, two electrons lost by magnesium atoms are gained by two chlorine atoms. Mg^{2+} and Cl^- being oppositely charged, attract each other and are held by strong electrostatic forces of attraction to exist as $MgCl_2$.

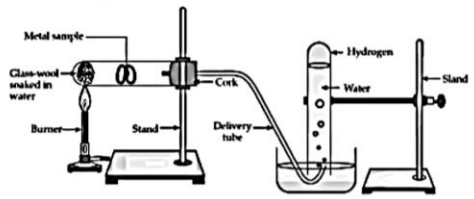
$$\underset{2,8,2}{Mg} \rightarrow \underset{2,8}{Mg^{2+}} + 2e^-$$
(Magnesium cation)

$$\underset{2,8,7}{Cl} \rightarrow \underset{2,8,8}{Cl^-}$$
(Chloride anion)



ii. Due to the strong force of attraction between the metal with a positive charge and metal with a negative charge, ionic compounds are solid.

iii. **Reaction with steam:** Metals like iron, zinc and aluminum react with steam to form corresponding hydroxide and hydrogen gas.



OR

The inertness or reluctance of the members of the noble gas family is linked with their structure. The first member helium (He) has two electrons in the only shell which is the K-shell. The atoms of all other members have eight electrons in their outermost shell, also called valence shell. The electronic configuration of the members of the family are as follows:

Noble gas element	Symbol	Atomic No. (Z)	Electronic Configuration	No. of electrons in outermost shell
Helium	He	2	2	2
Neon	Ne	10	2, 8	8
Argon	Ar	18	2, 8, 8	8
Krypton	Kr	36	2, 8, 18, 8	8
Xenon	Xe	54	2, 8, 18, 18, 8	8
Radon	Rn	86	2, 8, 18, 32, 18, 8	8

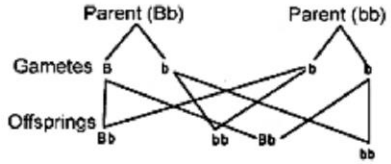
This is the maximum number of electrons which the atoms of these elements can have in their outermost shell. They have, therefore, no tendency to either lose or gain one or more electrons. In other words, these atoms are fully satisfied. The members of the family are called inert gases or noble gases.

29. i. Nutrition is necessary because
    a. it helps in the growth of new cells, survival and maintenance of cells.
    b. it is needed to develop resistance against diseases.
    c. it provides energy by the oxidation of food for metabolic processes.

    ii. The disappearance of green plants from Earth would mean a total disaster for the ecosystem.It will cause a decrease in concentration of oxygen to such a low level that it would not be sufficient for all the living organism for breathing. Green plants are the source of energy for all organisms. All other organisms directly or indirectly depend on them for food. So, if they disappear from the Earth, all the herbivores will die due to starvation and so will the carnivore. It would result in the extinction of life from the Earth.

30. a. Genotype of man: Bb (Heterozygous)
    Genotype of mother: bb
    (homozygous recessive)
    b. Possible genotype of his father: Bb (Heterozygous) or BB (homozygous dominant)
    c. Cross between heterozygous man and homozygous recessive blue-eyed woman Bb x bb 50% Blue-eyed
    50% Brown eyed.

The ratio obtained is 1 : 1 it is an example of test cross also.



31. $P = \frac{1}{f}, P \propto \frac{1}{f}$

The power of the lens is inversely proportional to the focal length of the lens. A lens with the focal length 20 has more power than a lens with a focal length of 40 cm.

Therefore, a lens with higher power should be used to obtain more convergent light.

32. Given,

Power P = 4 kW,

Voltage, V = 220 V

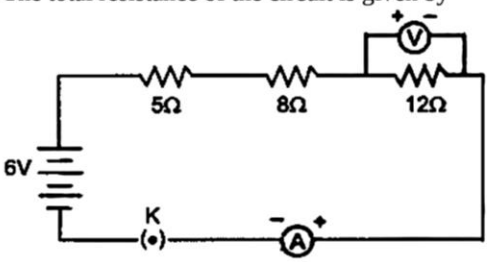
a. We know that, P = VI.

Therefore current I = $\frac{P}{V} = \frac{4kW}{220V} = \frac{4000W}{220V}$ = 18.18 A

b. Energy consumed in 2h = Pt = 4 kW × 2h = 8 kWh.

c. If cost of 1 kWh = ₹ 4.50, then cost of 8 kWh of energy = ₹ 4.50 × 8 = ₹ 36

33. The total resistance of the circuit is given by



R = 5 + 8 + 12 = 25Ω

We know, R = $\frac{V}{I}$

Hence, 25 = $\frac{6}{I}$

I = $\frac{6}{25}$ = 0.24 A

Since, resistances are connected in series, thus electric current remains the same through all resistors.

Here we have, Electric current, I = 0.24 A

Resistance, R = 12Ω

Thus, potential difference (V) through the resistor of 12Ω is given by

V = I × R

= 0.24 × 12 = 2.88 V

∴ Reading of ammeter = 0.24 A

Reading of voltmeter through resistor of 12 Ω = 2.88 V

Section D

34. i. Element A: Carbon

ii. Gas B: Carbon dioxide

iii. Allotrope C: Diamond

iv. Allotrope C is used for making jewellery

v. Buckminsterfullerene

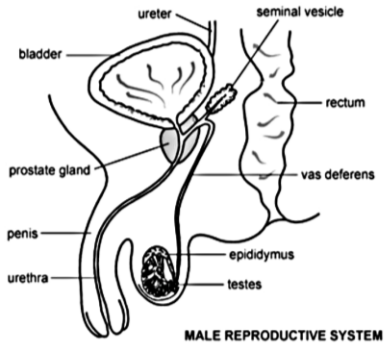
vi. Graphite

OR

Soaps	Synthetic detergents
1) Soaps are sodium or potassium salts of higher fatty acids e.g. sodium stearate.	1) Synthetic detergents are sodium alkyl sulphates or sodium alkyl benzene sulphonates e.g. sodium n-dodecylsulphate.
2) Soaps are prepared from vegetable oils animal and fats.	2) Synthetic detergents are prepared from the hydrocarbons obtained from petroleum.
3) Soaps have relatively weak cleansing action.	3) They have strong cleansing action.

4) Soaps form curdy white precipitate with calcium and magnesium salts present in hard water and hence, are not used in hard water.	4) Calcium and magnesium salts of detergents are soluble in water and therefore, no curdy white precipitates are obtained in hard water and hence synthetic detergents can be used even in hard water.
5) Soaps cannot be used in acidic medium as they are decomposed into carboxylic acids in acidic medium.	5) They can be used in acidic medium as they are the salts of strong acids and are not decomposed in acidic medium.
6) Soaps do not cause water pollution.	6) Synthetic detergents cause water pollution.
7) Soaps are biodegradable.	7) Some of the synthetic detergents are not biodegradable.

35. a. A pair of testes- Each testis produces sperms and male sex hormone called testosterone. Testes are present in small pouch called scrotum.
    b. Epididymis- It is a long coiled tube. The head is connected with testis and tail is connected with vas deferens
    c. Vas deferens- It is a long tube which begins from the tail of epididymis
    d. Urethra- It receives the vas deferens from both the testes. It opens outside through penis. It carries both sperms and urine.



MALE REPRODUCTIVE SYSTEM

OR

Plant Movement

Tropic movement or tropism

Directional movement of specific part of plant in response to external stimuli is called **tropism**.

These movements are very slow.The movement of plant part can be either towards or away from stimulus.

If the movement of plant is towards stimulus,it is called **positive stimulus**.

If the movement of plant is away from stimulus,it is called **negative stimulus**.

1) Phototropism: It is the directional movement of plant part in response to light stimulus.

If plant part move towards light it is called as **positive phototropism.**

For Ex:Stem or shoot

If plant part move away from light it is called as **negative phototropism.**

For Ex:Roots

2) Geotropism : It is the response to gravity.

If the plant part moves in the direction of gravity it is called **positive geotropism**

For Ex:Roots grow downwards.

If the plant part moves against the direction of gravity it is called **negative geotropism.**

For Ex:Stem grows upwards

3) Chemotropism : Response to chemical stimuli.

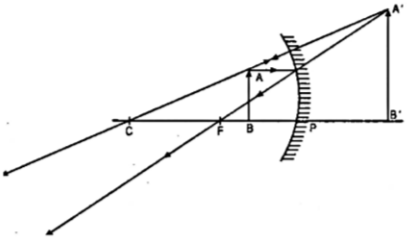
If Plant part move towards chemical stimuli it is **positive chemotropism**

If plant part move away from chemical stimuli it is **negative chemotropism.**

4) Hydrotropism : Response to water.

36. When the object is placed between pole and principal focus of the concave mirror, an erect, enlarged, virtual image is formed behind the mirror. Therefore range of distance is greater than zero and less than focal length i.e. between more than zero to less

than 15 cm.



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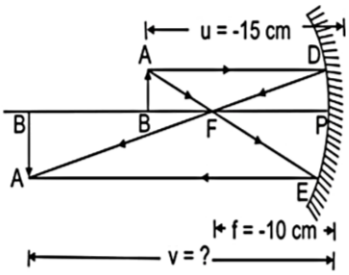


Here u = - 15 cm (Object is to the left of P)

f = - 10 cm (F is to the left of P)

v = ?

size of object = h_1

size of image h_2 = ?

Using $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$

$-\frac{1}{10} = \frac{1}{v} - \frac{1}{15}$

$\frac{1}{v} = \frac{1}{15} - \frac{1}{10} = \frac{2-3}{30} = -\frac{1}{30}$ or $v = -30cm$

Position of image is 30 cm to the left of P since negative sign of v indicates that the image is on the same side of the mirror.

Magnification $m = \frac{h2}{h1} = -\frac{v}{u}$ or $m = -\frac{(-30)}{(-15)} = -2$

Negative magnification indicates that the image is inverted, two times magnified and real.

Again $m = \frac{h2}{h1} = -2$ or $h2 = -2h1$

where h_2 is the size of the image and h_1, the size of the object.

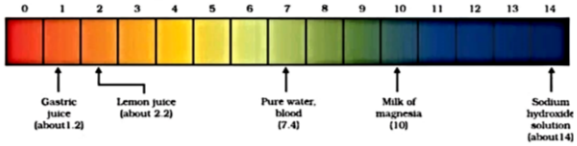
Here h_1 = 1 cm. h_2 = (-2) 1 = - 2 cm.

Size of the image is 2 cm and is inverted.

Section E

37. **Read the text carefully and answer the questions:**

The strength of acid and base depends on the number of H^+ and the number of OH^- respectively. If we take hydrochloric acid and acetic acid of the same concentration, say one molar, then these produce different amounts of hydrogen ions. Acids that give rise to more H^+ ions are said to be strong acids, and acids that give less H^+ ions are said to be weak acids. Can you now say what weak and strong bases are?



(i) The pH of milk is 6. As it changes to curd, the pH will reduce because curd is acidic in nature. The acids present in it decrease the pH.

(ii) Yes, gastric juice is a weak acid.

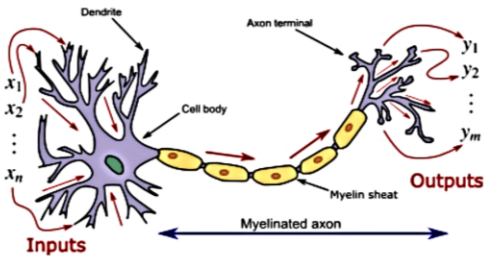
OR

Milk of magnesia is a base and it can be used as an antacid.

38. **Read the text carefully and answer the questions:**

In animals, control and coordination are provided by nervous and muscular tissues. Touching a hot object is an urgent and dangerous situation for us. We need to detect it and respond to it. How do we detect that we are touching a hot object? All information from our environment is detected by the specialised tips of some nerve cells. These receptors are usually located in our sense organs, such as the inner ear, the nose, the tongue, and so on. So gustatory receptors will detect taste while olfactory

receptors will detect the smell. This information, acquired at the end of the dendritic tip of a nerve cell, see figure, sets off a chemical reaction that creates an electrical impulse. This impulse travels from the dendrite to the cell body, and then along the axon to its end.



(i) Nerve cell is the largest cell present in the body.

(ii) Axon is a large, single, unbranched nerve fibre arising from the cyton. It carries impulses from cyton located in CNS to the effectors.

(iii) **Gustatory receptor:** Taste buds on the tongue. The receptors for gustation are located in the oral cavity, which brings food and fluids from outside the body into the gastrointestinal tract.

Olfactory receptor: Receptor in the nose. These receptors are common to arthropods, terrestrial vertebrates, fish, and other animals.

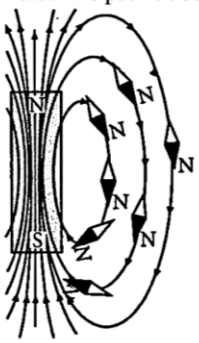
OR

a. Dendrites.

b. Axon.

39. **Read the text carefully and answer the questions:**

A magnetic field is described by drawing the magnetic field lines. When a small north magnetic pole is placed in the magnetic field created by a magnet, it will experience a force. And if the north pole is free, it will move under the influence of the magnetic field. The path traced by a north magnetic pole free to move under the influence of a magnetic field is called a magnetic field line.



Since the direction of the magnetic field line is the direction of the force on a north pole, so the magnetic field lines always begin from the N-pole of a magnet and end on the S-pole of the magnet. Inside the magnet, however, the direction of magnetic field lines is from the S-pole of the magnet to the N-pole of the magnet. Thus, the magnetic field lines are closed curves. When a small compass is moved along a magnetic field line, the compass needle always sets itself along the line tangential to it. So, a line drawn from the south pole of the compass needle to its north pole indicates the direction of the magnetic field at that point.

(i) No two magnetic field lines are found to cross each other. If two field lines crossed each other, it would mean that at the point of intersection, the compass needle would point in two directions at the same time, which is not possible.

(ii) The magnetic field and hence the magnetic line of force exist in all the planes all around the magnet.

(iii) The magnetic lines of force are uniform and strong at point C and they diverge as they move towards points A and B and the distance between the lines increases. Eventually, the strength of the magnetic field is strong where the lines are closer and they weaken as the closeness decreases i.e., at point C.

OR