CBSE Class 10 Science

Sample Paper 05 (2020-21)

Maximum Marks: 80

Time Allowed: 3 hours

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. Answers 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 labeled diagrams should be drawn.

Section A

1. Identify the type of chemical reaction
   i. $A + B \rightarrow C$
   ii. $A + BC \rightarrow AC + B$

OR

Bhawna took a pale green substance A in a test tube and heated it over the flame of a burner. A brown coloured residue B was formed along with evolution of two gases with

burning smell of sulphur. Identify A & B. Write the chemical reaction involved.

2. Write the formula and then balance the following equation.
   Sodium nitrate $\rightarrow$ Sodium nitrite + Oxygen
3. Diamond is not a good conductor of electricity because:
   a. It is not soluble in water
   b. It is very hard
   c. It has no free electrons to conduct electric current
   d. Its structure is very compact
4. What is the minimum distance between an object and its real image formed by a convex lens?
5. What would have been the colour of the sky, if the Earth had no atmosphere?
6. Name the compound of calcium used for disinfecting water. Give its chemical formula.

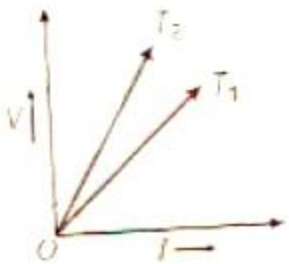
OR

What effect does the concentration of $H^+(aq)$ ions have on the acidic nature of the solution?

7. How does the mass of wire changes when the current is flowing in the wire ?
8. Why are magnetic field lines closed curves?
9. What is measured by an ammeter ?

OR

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



10. What is the specialized function of erythrocytes?
11. Write functions of lymph.

OR

When asked to set-up an experiment to show that "light is necessary for photosynthesis", a student ran to the school garden and set-up the experiment using a plant growing in the school garden. The experiment failed. His fellow students made the following suggestions to get success :

Student A : Safranin should be used instead of Iodine.

Student B : The leaf should not be boiled in alcohol to remove chlorophyll before testing the starch.

Student C : Transparent paper strip should be used instead of black paper strip.

Student D : The plant should be destarched before starting the experiment.

Who made the right suggestion?

12. Name two salt water ecosystem.

OR

Write the common food chain of a pond ecosystem.

13. Why the walls of ventricles are thicker than the walls of atria?
14. **Assertion:** In the following chemical equation,

    $CuO\ (s) + Zn\ (s) \rightarrow ZnO\ (s) + Cu\ (s)$

    Zinc is getting oxidised and copper oxide is getting reduced.

    Reason: The process in which oxygen is added to a substance is called oxidation whereas the process in which oxygen is removed from a substance is called reduction.

    a. Both assertion and reason are CORRECT and reason is the CORRECT explanation of the assertion.
    b. Both assertion and reason are CORRECT but, reason is NOT THE CORRECT explanation of the assertion.
    c. Assertion is CORRECT but, reason is INCORRECT.
    d. Assertion is INCORRECT but, reason is CORRECT.
15. **Assertion (A):** Green plants of the ecosystem are the transducers.

    Reason (R): Producers trap the radiant energy of the sun and the change it into chemical energy.

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

OR

Assertion (A): Plants lack excretory organs.

Reason (R): Plants usually absorbs essential nutrients.

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

16. **Assertion (A):** Mendel selected the pea plant for his experiments.

    Reason (R): Pea plant is cross-pollinating and has unisexual flowers.

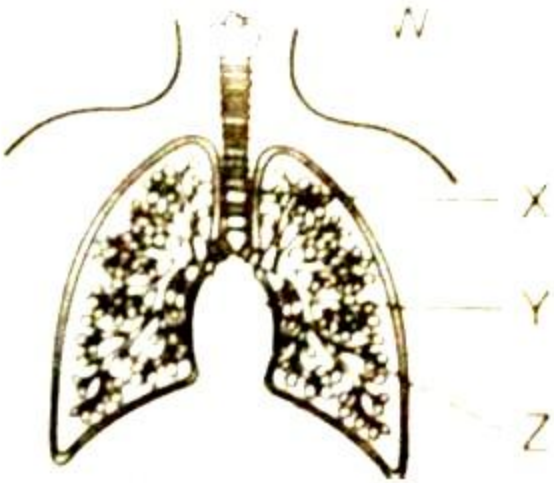
    a. Both A and R are true and R is correct explanation of the assertion.
    b. Both A and R are true but R is not the correct explanation of the assertion.
    c. A is false but R is true.
    d. A is true but R is false.

17. **Read the following and answer any four questions:**

    Breathing in humans involves three steps- Inspiration, gaseous exchange, and expiration. When we breathe in, ribs move up and flatten the diaphragm due to which the chest cavity increases. As a result, air moves into the lungs. During gaseous exchange haemoglobin binds with the oxygen and carries it along with the blood in the body. Oxygen diffuses into the cell and carbon dioxide diffuses into the blood. It is then carried to the lungs for expiration. During expiration, ribs move down and the diaphragm becomes dome-shaped decreasing the chest cavity thus pushing the air out of the lungs.

    i. What is the correct sequence of air passage during inhalation.?
        a. Nostrils $\longrightarrow$ Larynx $\longrightarrow$ Pharynx $\longrightarrow$ Trachea $\longrightarrow$ Lungs
        b. Nasal passage $\longrightarrow$ Trachea $\longrightarrow$ Pharynx $\longrightarrow$ Larynx $\longrightarrow$ Alveoli
        c. Larynx $\longrightarrow$ Nostrils $\longrightarrow$ Pharynx $\longrightarrow$ Lungs
        d. Nostrils $\longrightarrow$ Pharynx $\longrightarrow$ Larynx $\longrightarrow$ Trachea $\longrightarrow$ Alveoli

    ii. The diagram shows part of the human gas exchange system.



What are W, X, Y, and Z?

	Bronchus	Bronchiole	Larynx	trachea
(a)	W	X	Z	Y
(b)	X	Z	Y	W
(c)	Y	W	X	Z
(d)	Z	Y	W	X

iii. In which organism the cell membrane acts as the respiratory surface?

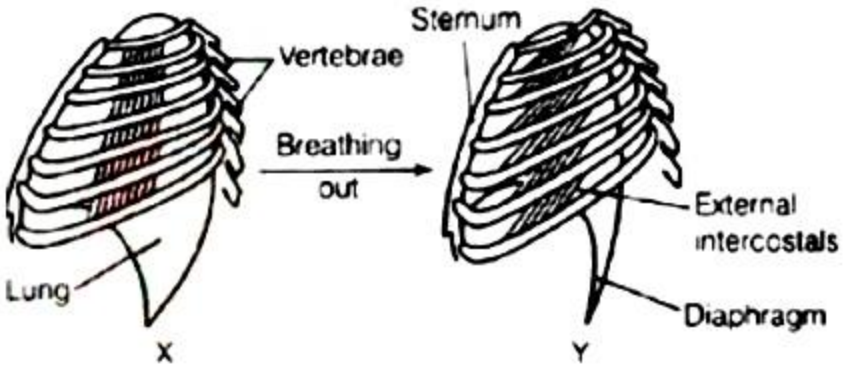
a. Amoeba

b. Fish

c. Earthworms

d. Lizards

iv. The diagram shows the ribs and some of the muscles used in breathing:



Which muscle relaxes in moving from position X to position Y?

	Diaphragm	Intercostal muscle
(a)	No	No

(b)	No	Yes
(c)	Yes	No
(d)	Yes	Yes

v. The part where the exchange of gases occurs during respiration is
   a. lungs and larynx
   b. alveoli and throat
   c. alveoli and capillaries
   d. throat and lungs

18. **Read the following and answer any four questions:**

Common salt is an important raw material for various materials of daily use such as sodium hydroxide, baking soda, bleaching powder. These material are prepared by various procedures such as sodium hydroxide is prepared when electricity is passed through an aqueous solution of NaCl it decomposed to form sodium hydroxide. The process is called the chloralkali process. While bleaching powder is prepared by the action of chlorine on dry slaked lime ($Ca(OH)_2$). Washing soda is prepared by crystallisation of sodium carbonate.

i. The product of the Chlor-alkali process is
   a. NaCl, Cl_2 and H_2
   b. H_2, Cl_2 and NaOH
   c. Cl_2, Na_2CO_3 and H_2O
   d. NaOH, Cl_2 and HCl

ii. Name an acid present in baking powder.
   a. HCl
   b. Nitric acid
   c. Tartaric acid
   d. Sulphuric acid

iii. Washing soda is
   a. acidic salt
   b. neutral salt
   c. basic salt
   d. none of the above

iv. Which salt is used in the manufacturing of borax?
   a. Washing soda
   b. Bleaching powder
   c. Baking soda
   d. None of the above

v. Sodium hydroxide solution is formed near the:
   a. anode
   b. cathode
   c. both cathode and anode
   d. neither cathode nor anode

19. **Read the following and answer any four questions:**

A battery is a source of electrical energy. The chemical reaction within the cell generates the potential difference between its 2 terminal that sets the electron in the motion to flow the current through the resistor for the steady current I, the amount of heat H produce in time T is H = VIT applying ohm's law, we get joule's law of heating. The heating effect of electric current has many useful applications such as electric laundry iron, toaster etc. Another common application of joules heating is a fuse.

i. Joule's law of heating implies that heat production in a resistor is:
   a. directly proportional to the square of current for a given resistor
   b. directly proportional to resistance for a given current
   c. directly proportional to time for which current flow through the resistor
   d. all of these

ii. Joule's law of heating is:
   a. $H = IR^2T$
   b. $H = I^2RT$
   c. $H = IRT^2$
   d. $H = IRT$

iii. The melting point of tungsten is:
   a. 3380°C
   b. 4450°C
   c. 3370°C
   d. 3350°C

iv. The bulbs are usually filled with:

a. chemically inactive nitrogen
b. argon gases
c. both (a) and (b)
d. none of these

v. The fuse is placed in _____ with the device.
a. series
b. parallel
c. perpendicular
d. diagonal

20. **Read the following and answer any four questions:**

Non - metals are either solids or gases. Non-metal can exist in different forms such as carbon. Each form is called allotrope. Alkali metal is so soft that it can be cut with a knife. They have low density and low melting point. Some metal can melt if they are kept in the palm.

i. Which of the following non - metal is liquid?
a. Bromine
b. Oxygen
c. Iodine
d. Hydrogen

ii. An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be:
a. calcium
b. carbon
c. silicon
d. iron

iii. Which of the following pair of reactants can undergo a displacement reaction under appropriate condition?
a. $MgSO_4$ + Fe
b. $ZnSO_4$ + Fe
c. $MgSO_4$ + Pb
d. $CuSO_4$ + Fe

iv. Which of the following is the allotrope of carbon?

a. Diamond
b. Graphite
c. Both (a) and (b)
d. None of these

v. Non-metal which is lustrous:
a. bromine
b. iodine
c. oxygen
d. hydrogen

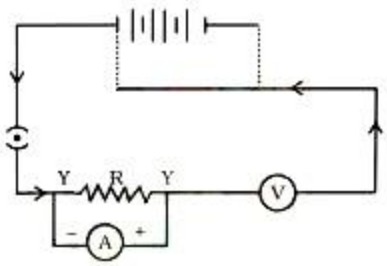
Section B

21. Describe the urinary bladder.

OR

What is the role of Hydrochloric acid in our stomach?

22. Explain the ways in which glucose is broken down in absence or shortage of oxygen.
23. How do alcohols differ structurally from alkanes?
24. Does Tartaric acid helps in making cake or bread fluffy. Justify.
25. A dentist uses a mirror in front of a decayed tooth at a distance of 4 cm from the tooth to get a four times magnified image in the mirror. Use mirror formula to find the focal length and nature of the mirror used.
26. A Child has drawn the electric circuit to study Ohm's law as shown in Figure. His teacher told that the circuit diagram needs correction. Study the circuit diagram and redraw it after making all corrections.



27. A man with type A blood has a wife with type B. They have a child with type O blood. Give the genotype of all the three. What other blood groups can be expected in the future offspring of this couple?

OR

Explain Mendel's observation when he crossed a homozygous tall (TT) plant with homozygous dwarf (tt) plant followed by self-cross.

28. We do not clean ponds or lakes, but an aquarium needs to be cleaned. Why?
29. What are the functions of liver ?
30. What is a balanced chemical equation ? Why should chemical equations be balanced ?
31. An element X belongs to 3rd period and group 16 of the modern periodic table.
    i. Determine the number of valence electrons and the valency of X.
    ii. Molecular formula of the compound when X reacts with hydrogen and write its electron dot structure.
    iii. Name the element X and state whether it is metallic or non-metallic.
32. State Periodic Law on which modern periodic table is based.
33. Is the position of a star as seen by us its true position? Justify your answer.
34. a. List four characteristics of the images formed by plane mirrors.
    b. A 5 cm tall object is placed at a distance of 20 cm from a concave mirror of focal length 30 cm. Use mirror formula to determine the position and size of the image formed.

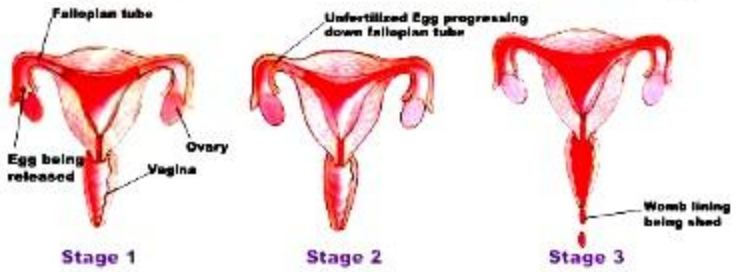
OR

i. Two lenses have power of
    a. + 2 D
    b. - 4 D.

    What is the nature and focal length of each lens?

ii. An object is kept at a distance of 100 cm from each of above lenses. Calculate
    a. image distance and
    b. magnification in each of the two cases.

35. The diagram shows ovulation and menstrual cycle in females.



Using the above diagram, answer the following questions:

i. At what age the sex hormones are released into a female body?

ii. How the uterus prepares every month to receive a fertilized egg?

iii. What happens if the egg is not fertilized?

iv. How ovulation takes place?

v. When does menstruation occur after ovulation?

36. Draw the pattern of magnetic field lines produced around a current carrying straight conductor passing perpendicularly through a horizontal cardboard. State and apply right-hand thumb rule to mark the direction of the field lines. How will the strength of the magnetic field change when the point where magnetic field is to be determined is moved away from the straight conductor? Give reason to justify your answer.

OR

Define electromagnetic induction? Two circular coils A and B are placed close to each other. If the current in the coil A is changed, will some current be induced in the coil B? Explain.

CBSE Class 10 Science

Sample Paper 05 (2020-21)

Solution

Section A

1. i. Combination reaction as substances A and B combine together to form C.
   ii. Displacement reaction as A being a more reactive metal than B has replaced it from its salt solution.

   OR

   $$\underset{\text{A(green)}}{2FeSO_4(s)} \xrightarrow{Heat} \underset{\text{B(brown)}}{Fe_2O_3(s)} + SO_2(g) + SO_3(g)$$

   This is a thermal decomposition reaction.
2. Sodium nitrate $\rightarrow$ Sodium nitrite + Oxygen

   $2NaNO_3 \rightarrow 2NaNO_2 + O_2$
3. (c) It has no free electrons to conduct electric current

   Explanation: Diamond is not a good conductor of electricity because it has no free electrons in its structure (like graphite) to conduct electric current.
4. The minimum distance is 4f, i.e. when an object is placed at one of the two centres of curvature and the image is formed at the other centre of curvature, the image will be real.
5. If the earth has no atmosphere, the sky would have appeared black because of no refraction.
6. Bleaching powder is used for disinfecting water. Chemical formula of bleaching powder is $CaOCl_2$.

   OR

   Water contains exactly the same number of hydrogen (H^+) ions and hydroxyl (OH^-) ions. Acidic solution contains more hydrogen ions than contained by water. It is the presence of hydrogen ions which gives acidic properties to an acid solution. Higher the concentration of hydrogen (H^+) ions in a solution, more acidic is the solution.

$HCl\ (aq) \rightarrow H^+\ (aq) + Cl^-\ (aq)\ ;\ H^+\ (aq) + H_2O\ (aq) \rightarrow H_3O^+\ (aq)$

7. It remains the same.
8. The magnetic field lines are closed curves because magnetic field lines originate from the north pole of a magnet and end at its south pole and inside the magnet, it is directed from south pole to north pole.
9. Ammeter is a apparatus to measure electric current in a circuit.

OR

Resistance is equal to the slope of V-I graph. Here, slope of graph for temperature T_2 is higher, so resistance for temperature T_2 is higher, As resistance is directly proportional to the temperature.

10. To transport oxygen as oxyhaemoglobin from respiratory organs to tissue.
11. **Functions of lymph**
    1. It drains excess tissue fluid from the extracellular spaces back into the blood.
    2. Some of the fluid from the digestive tract is absorbed in the lymph. The lymphatic vessels store this fluid temporarily, and release it gradually so that the kidneys do not face a sudden pressure of urine excretion.
    3. It carries carbon dioxide and nitrogenous waste materials that diffuse into the tissue fluid to the blood.
    4. It takes lymphocytes and antibodies from the lymph nodes to the blood.

OR

The right suggestion was made by Student D. Destarching the leaf by keeping the plant in darkness before starting the experiment is essential.

12. Marine and estuaries ecosystem are salt water ecosystem.

OR

Phytoplanktons and aquatic plants (producers)→ small aquatic animal's larvae, shrimp, insects (primary consumers) →fish (secondary consumers) →bird (tertiary consumers)

13. Ventricles have to pump blood into various organs (at large distance) with high pressure, so they have thicker walls than atria.

14. (a) Both assertion and reason are CORRECT and reason is the CORRECT explanation of the assertion.
15. (a) Both A and R are true and R is correct explanation of the assertion.

OR

(a) Both A and R are true and R is correct explanation of the assertion.

16. (a) Both A and R are true and R is correct explanation of the assertion.
17. i. (d) Nostrils $\longrightarrow$ Pharynx $\longrightarrow$ Larynx $\longrightarrow$ Trachea $\longrightarrow$ Alveoli

ii.

	Bronchus	Bronchiole	Larynx	trachea
(d)	Z	Y	W	X

iii. (a) Amoeba

iv.

	Diaphragm	Intercostal muscle
(d)	Yes	Yes

v. (c) Alveoli and capillaries

18. i. (b) H_2, Cl_2 and NaOH

ii. (b) Tartaric acid

iii. (c) basic salt

iv. (a) Washing soda

v. (b) cathode

19. i. (d) all of these

ii. (b) $H = I^2RT$

iii. (a) 3380°C

iv. (c) both (a) and (b)

v. (a) series

20. i. (a) Bromine

ii. (a) calcium

iii. (d) $CuSO_4$ + Fe

iv. (c) Both (a) and (b)

v. (b) iodine

Section B

21. The urinary bladder is a hollow, thin membranous and muscular sac serving as the reservoir of urine. It stores the urine temporarily and has the capacity of 300-800 ml. Its wall is lined by modified stratified epithelium. It leads to urethra through which the urine is sent to the exterior. The junction of the bladder and urethra is guarded by sphincter muscles.

OR

Functions of HCl

i. It provides acidic medium. It is required for action of enzymes it changes the pH of food from almost neutral to acidic medium (from pH 7 to 2).

ii. Destroys the bacteria present in food.

iii. HCl is also essential in the breakdown of various vital nutrients. It allows for the digestion and absorption of the trace minerals zinc, iron, copper, magnesium, calcium, selenium, and vitamins B_{12} and vitamin B_3.

iv. Hydrochloric acid denatures proteins by basically cleaving the bonds and melting the proteins. Hydrochloric acid also activates pepsin, via its conversion from a substance called pepsinogen. The function of Pepsin is to mainly digest the protein we eat.

22. The first step of breaking down glucose into pyruvate is the same in all.
Then, in the absence of oxygen, pyruvate changes into ethanol, CO_2, energy. Ex - yeast
When there is a lack of oxygen in our muscle cells, pyruvate changes into lactic acid and energy.

23. Alcohols are obtained by replacing hydrogen atom of alkanes with the functional group OH.

$$\underset{alkane}{RH} \xrightarrow[+OH]{-H} \underset{alcohol}{R-OH}$$

(where R is an alkyl group)

24. No, tartaric acid does not evolve any carbon dioxide during baking. Its role is to react with Na_2CO_3 formed when $NaHCO_3$ decomposes.

$$\begin{array}{l} \text{CH (OH)COOH} \\ | \\ \text{CH (OH)COOH} \\ \text{Tartaric acid} \end{array} + Na_2CO_3 \rightarrow \begin{array}{l} \text{CH (OH) COONa} \\ | \\ \text{CH (OH) COONa} \\ \text{Disod. Tartarate} \end{array} + H_2O + CO_2$$

If this not happens, Na_2CO_3 will impart a bitter taste to the cake.

25. Given-

Magnification (m) = 4;

Object distance (u) = -4cm;

Image distance = v;

Magnification (m) = $-\frac{v}{u}$

$\Rightarrow 4 = -\frac{v}{-4}$

$\Rightarrow$ v = 4 × 4 = 16cm

Image distance = 16cm.

By mirror formula;

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

$\Rightarrow \frac{1}{16} - \frac{1}{4} = \frac{1}{f}$

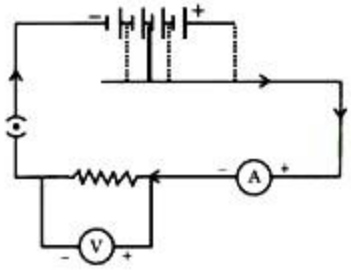
$\Rightarrow \frac{1-4}{16} = \frac{1}{f}$

$\Rightarrow -\frac{3}{16} = \frac{1}{f}$

$\Rightarrow f = -\frac{16}{3} = -5.33\ cm$

Hence the focal length is -5.33cm. Since the focal length is negative therefore the mirror is concave.

26. Correct diagram is as follows:



27. a. Genotypes. Man ($I^A I^O$) Mother $I^B I^O$ and child $I^O I^O$.

b. Blood group of the future offspring. A type, B type, O type and AB type. It is based on the following cross:

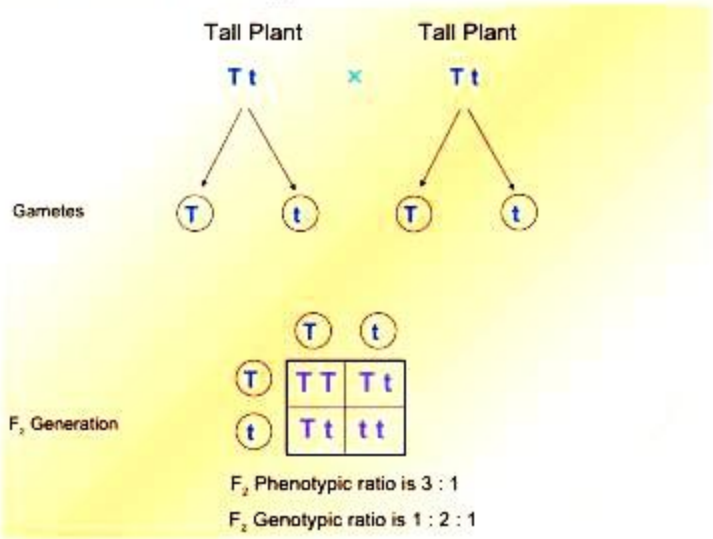
♀ \ ♂	I^A	I^O
I^B	I^AI^B	I^BI^O
I^O	I^AI^O	I^OI^O

OR

When Mendel crossed a homozygous tall (TT) plant with homozygous dwarf (tt) plant, all plants in F_1 generation were tall (Tt).

Self crossing of F_1 gives F_2. F_2 generation had 3 tall : 1 recessive plants.

Since presence of dwarf allele was masked by tall allele in F_1, tall allele (T) was dominant over dwarf allele (t).



28. An aquarium is an artificial and incomplete ecosystem in contrast to a pond/lake which are natural, self-sustaining and complete ecosystems. Ponds and lakes have their own cleaning mechanisms because of presence of various microorganisms but Aquarium lacks decomposer microbes which convert the complex organic compounds of dead organisms into simple substances that can be reused by plants. Hence the dead fishes of the aquarium are not decomposed. so it needs regular cleaning.
29. **Functions of liver**
    1. **Role in digestion**. Bile produced in liver helps in the digestion of food as follows.
        a. It emulsifies the fats with its salts.
        b. It prevents decomposition of food by checking the growth of bacteria.
        c. It nutralizes the acid coming from the stomach along with food and provide alkaline medium in the intestine required for action of enzymes of pancreas and intestinal glands.
    2. **Regulation of blood sugar.** The liver separates the excess of sugar from the blood and stores it in its cells as glycogen (animals starch). This process is called glycogenesis and is aided by the pancreatic hormone insulin.
    3. Formation of Glycogen from non-carbohydrate sources.
    4. Deamination. In the liver, the amino acids coming from the alimentary canal are

sorted out, ammonia is formed. Ammonia is converted to less toxic urea.

5. Excretion. Liver collects haemoglobin of the worn-out red blood corpuscles and changes it into bile pigments.

30. 1. A chemical equation in which the number of atoms of different elements on the reactants side (left side) are same as those on product side (right side) is called a balanced chemical equation.

$Zn + 2HCl \rightarrow ZnCl_2 + H_2 \uparrow$

2. All the chemical equations must balance, because atoms are neither created nor destroyed in chemical reactions.
3. The number of atoms of each element before and after reaction must be the same.
4. According to the law of conservation of mass, the total mass of the substances that are taking part in a chemical reaction must be the same before and after the reaction.

31. i. The element X belong to 3rd period and group 16 of the modern periodic table. Hence, its atomic number is 16. As 3rd period refers to the 3 number of shells.

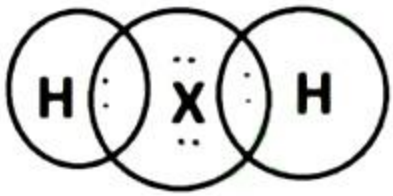
Its electronic configuration = $\overset{K}{2},\ \overset{L}{8},\ \overset{M}{6}$

Its valency electrons = 6

Its valency is (8 - 6) = 2.

ii. Molecular formula of the compound X with hydrogen is H_2X.

Its electron dot structure is as follows:



iii. Name of the element X is sulphur(S) it lies below oxygen in the modern periodic table. It is a non-metal, as it is present at extremely left side of the modern periodic table and has tendency to gain electron thus, have electronegative behaviour.

32. Law of Modern Periodic Table states that properties of elements are the periodic function of their atomic numbers. In the modern periodic table, elements are arranged in order of their increasing atomic numbers.

Explanation of Modern Periodic Table:

i. Elements are arranged in order of their increasing atomic numbers.

ii. The vertical columns are known as groups and horizontal columns are known as periods; in the modern periodic table.

iii. There are 18 groups and 7 periods in the modern periodic table.

33. No, the position of a star as seen by us is not its true position that is the apparent position. The stars appear slightly higher than the actual position because the light coming from the stars suffers refractions due to different layers of atmosphere which is due to different refractive indices value. It seems as if stars are slightly higher than they actually appear.

34. a. The four Characteristics of image formed by plane mirror:-

    i. The image is same size as the object.

    ii. The image is erect and virtual.

    iii. The image is laterally inverted.

    iv. The distance between the object and mirror is same as the distance between image and mirror.

    b. Given: height of object h = 5 cm, distance of object u = - 20 cm, focal length of mirror f = - 30 cm

    $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ (By using mirror formula)

    $\frac{1}{v} = \frac{1}{-30} - \frac{1}{-20}$

    v = 60 cm

    The image is formed at 60 cm on the backside of the mirror.

    Now, magnification $m = \frac{h'}{h} = -\frac{v}{u}$

    h' = 15 cm

    The size of the image is 15 cm

OR

i. a. Given, P = + 2D

    P is positive, so lens is convex .

    $\therefore$ f = $\frac{1}{P} = \frac{1}{2} = 0.5\ m = 50cm$

    b. Given, P = -4D

    P is negative, so lens is concave .

    $\therefore$ f = $\frac{1}{P} = \frac{1}{-4}$

    = - 0.25 m = - 25cm

ii. a. As u = -100cm

    Case I f = 50 cm

    Then by lens formula, $-\frac{1}{u} + \frac{1}{v} = \frac{1}{f},\ we\ get$

$\frac{1}{v} = \frac{1}{f} + \frac{1}{u} = \frac{1}{50} - \frac{1}{100} = \frac{1}{100}$

or v = 100 cm

Case II f = -25 cm

By lens formula, $-\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$,

$\frac{1}{v} = \frac{1}{f} + \frac{1}{u} = -\frac{1}{25} - \frac{1}{100} = \frac{-5}{100} = -\frac{1}{20}$

v = -20 cm

b. As, $m = \frac{v}{u}$

Case I: u = - 100 cm, v = 100 cm

$m = \frac{100cm}{-100cm} = -1$

Case II: u = -100 cm, v = -20 cm

$m = \frac{-20cm}{-100cm} = \frac{1}{5} = 0.2$

35. i. When a girl reaches puberty at the age of 10-12 years, the sex hormones are released in her blood that causes some of the ova in the ovaries to become mature.

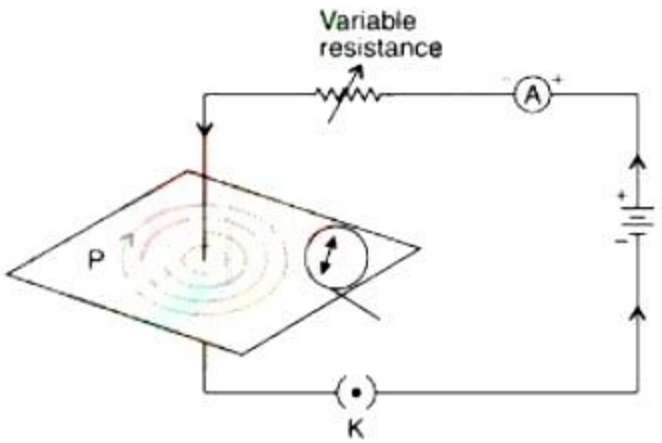
ii. Before ovulation, the inner lining of the uterus becomes thick and spongy, and full of blood capillaries, and prepares itself to receive the fertilized egg.

iii. If the ovum does not get fertilized, then the thick and soft inner lining of the uterus is no longer needed and hence it breaks and the dead ovum comes out from the vagina in the form of bleeding called menstruation.

iv. Usually, one mature egg is released from the ovary into the oviduct once every 28 days. This is called ovulation.

v. Menstruation usually occurs 14 days after ovulation and usually lasts for 3 to 5 days.

36.



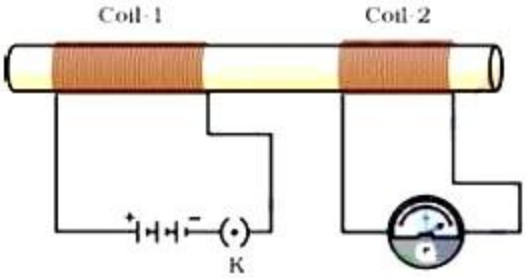
Maxwell Right-hand Thumb Rule: Hold a current carrying conductor in right hand such that thumb points the direction of current then fingers wrapped around the conductor. The fingers point in the direction of magnetic field lines of the magnetic field.

Reason:- The magnetic field strength decreases with increase of distance from the current carrying conductor.

There is a inverse relationship between field strength and distance from current carrying conductor. $Field\ strength \propto \frac{1}{distance\ of\ point\ from\ the\ current\ carrying\ conductor}$

OR

Electromagnetic induction means the production of induced current in a closed coil due to the change in the magnetic field.



When current flows in coil-1, magnetic flux sets up around coil A due to which some magnetic field sets up around coil-2 and when current in coil-1changes, magnetic field around coil-2 also changes thus some induced current flow through coil B due to which galvanometer deflects.