Class-X Session 2022-23
Subject - Science (086)
Sample Question Paper - **35**
With Solution

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S. No.	Chapter Name	Section-A (MCQs & A/R) 1 Mark	Section-B (VSAQs) 2 Marks	Section-C (SAQs) 3 Marks	Section-D (LAQs) 5 Marks	Section-E (Case Study) 4 Marks	Total Marks
		Q. No.	Q. No.	Q. No.	Q. No.	Q. No.	
1	Chemical Reactions and Equations	3(Q1,6,7)		1(Q27)			6
2	Acids, Bases and Salts	1(Q2)	1(Q21)		1(Q34)		8
3	Metals and Non-metals	2(Q3,5)	1(Q OR 21)			1(Q37)	6
4	Carbon and its Compounds	2(Q4,17)		1(Q28)			5
5	Life Processes	2(Q8,11)		1(Q31)		1(Q38)	9
6	Control and Co-ordination	1(Q10)	1(Q24)	1(Q32)			6
7	How do Organism Reproduce	2(Q12,19)	2(Q25,23)				6
8	Heredity and Evolution	2(Q9,20)	1(Q26)				4
9	Light- Reflection and Refraction	2(Q13,18)			1(Q36)	1(Q39)	11
10	Human Eye and Colourful World	1(Q15)					1
11	Electricity	1(Q14)	1(Q22)	1(Q30)			6
12	Magnetic Effects of Electric Current	1(Q16)		2(Q29,33)			7
13	Our Environment				1(Q35)		5
	*** Total Questions (Total Marks)**	**20(20)**	**6(12)**	**7(21)**	**3(15)**	**3(12)**	**80**

* The number given outside the bracket denotes number of questions asked in the sample paper, while the number given inside the bracket denotes marks.

Time Allowed : 3 Hours **Max. 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 Answer type questions carrying 02 marks each. Answers to these questions should 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 in the range of 50 to 80 words
6. **Section D** consists of 3 Long Answer type questions carrying 05 marks each. Answer 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

Select and write one most appropriate option out of the four options given for each of the Questions 1 to 20

1. Which of the following can be decomposed by the action of light?
(a) NaCl (b) KCl (c) AgCl (d) CuCl

2. A sample of soil is mixed with water and allowed to settle. The clear supernatant solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish-blue?
(a) Lemon juice (b) Vinegar (c) Common salt (d) An antacid

3. Pure gold is –
(a) 24 carats (b) 22 carats (c) 20 carats (d) 18 carats

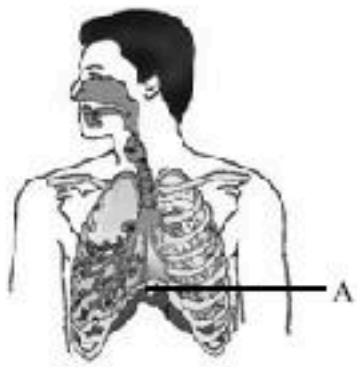
4. Pentane has the molecular formula C_5H_{12}. It has
(a) 5 covalent bonds (b) 12 covalent bonds (c) 16 covalent bonds (d) 17 covalent bonds

5. Among Mg, Cu, Fe, Zn the metal that does not produce hydrogen gas in reaction with hydrochloric acid is
(a) Cu (b) Zn (c) Mg (d) Fe

6. Take about 1.0g $CaCO_3$ in a test tube. Heat it over a flame, a colourless gas comes out. The reaction is called a
(a) decomposition reaction (b) displacement reaction
(c) double decomposition reaction (d) double displacement reaction

7. A substance A reacts with another substance B to produce the product C and a gas D. If a mixture of the gas D and ammonia is passed through an aqueous solution of C, baking soda is formed. The substances A and B are
(a) HCl and NaOH (b) HCl and Na_2CO_3 (c) Na and HCl (d) Na_2CO_3 and H_2O

8. Which of the following statements are correct in reference to the role of A (shown in the given diagram) during a breathing cycle in human beings?



(i) It helps to decrease the residual volume of air in lungs.
(ii) It flattens as we inhale.
(iii) It gets raised as we inhale.
(iv) It helps the chest cavity to become larger.
(a) (ii) and (iv) (b) (iii) and (iv) (c) (i) and (ii) (d) (i), (ii) and (iv)

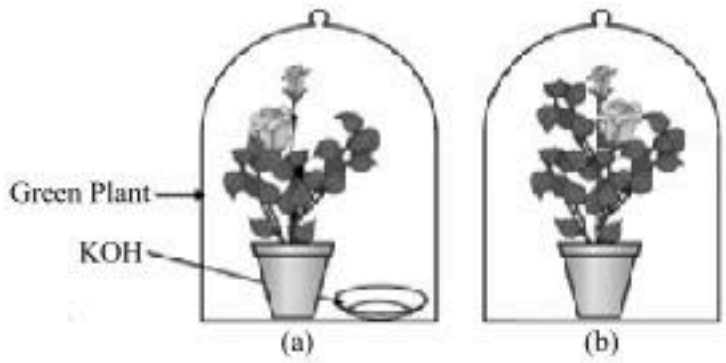
9. A pea plant with round green (RRyy) pea seed is crossed another pea plant with wrinkled yellow (rrYY) seeds. What would be the nature of seed in the first generation (F_1 generation) ?

(a) Round green (b) Wrinkled green (c) Wrinkled yellow (d) Round yellow

10. Sequence of events which occured in a reflex action are

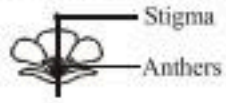
(a) Receptor - motor neuron - CNS - sensory neuron - effector muscle
(b) Effector muscle - CNS - sensory nerve - sensory organ
(c) CNS - sensory neuron - motor neuron - effector muscle
(d) Receptor organ - sensory neuron - CNS - motor neuron - effector muscle

11. A student was asked to write a stepwise procedure to demonstrate that carbon dioxide is necessary for photosynthesis. He wrote the following steps. The wrongly worded step is –



(a) Both potted plants are kept in dark room for at least three days.
(b) Bottom of the bell jars is sealed to make them air tight.
(c) Both potted plants are kept in sunlight after the starch test.
(d) A leaf from both the plants is taken to test the presence of starch.

12. From the following drawing of flowers identify the flower which will self pollinate?

(a) 

(b) 

(c) 

(d) 

13. If the refractive indices for water and diamond relative to air are 1.33 and 2.4 respectively, then the refractive index of diamond relative to water is –

(a) 5.5 (b) 1.80 (c) 3.19 (d) None of these

14. Resistance of conductor is doubled keeping the potential difference across it constant. The rate of generation of heat will

(a) become one fourth (b) be halved (c) be doubled (d) become four times

15. The least distance of distinct vision for a young adult with normal vision is about

(a) 25 m (b) 2.5 cm (c) 25 cm (d) 2.5 m

16. The force experienced by a curetn-carrying conductor placed in a magnetic field is the largest when the angle between the conductor and the magnetic field is:

(a) 45° (b) 60° (c) 90° (d) 180°

Directions: Q.No. 17–20 are Assertion - Reasoning based questions: These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true and R is not the correct explanation of A
(c) A is true but R is false
(d) A is False but R is true

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17. **Assertion:** Carbon monoxide is extremely poisonous in nature.
Reason: Carbon monoxide is formed by complete combustion of carbon.

18. **Assertion:** Convex mirror is used as a driver mirror.
Reason: Images formed by convex mirror are diminished in size.

19. **Assertion:** In very rare cases, a surrogate mother may have to be used to bring up in vitro fertilised ovum to maturity.
Reason: Success rate of test tube baby is more than 90%

20. **Assertion:** The principal of segregation given by Mendel is the principle of purity of gametes
Reason: Gametes are pure for a character and do not mix up.

SECTION-B

Q. no. 21 to 26 are Very Short Answer Questions.

21. pH of two samples of cold drinks A and B are 2 and 5. Which is more unhealthy?

OR

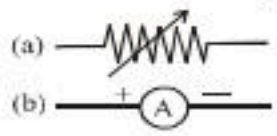
$CuSO_4 + Fe \longrightarrow FeSO_4 + Cu$

$FeSO_4 + Zn \longrightarrow ZnSO_4 + Fe.$

On the basis of above reactions, indicate which is most reactive and which is least reactive?

22. (i) What is meant by the statement: The potential difference between two points is 1 volt?

(ii) What do the symbols given represent in a circuit? Write one function of each.



OR

The resistance of a wire of 0.01 cm radius is 10Ω. If the resistivity of the material of the wire is 50×10^{-8} ohm meter, find the length of the wire.

23. (a) What are the phases of menstrual cycle ?

(b) What is difference between menarche and menopause?

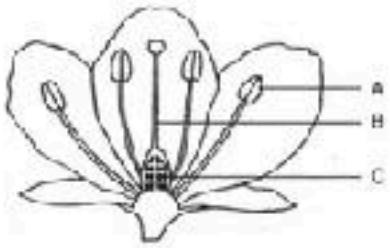
24. What is phototropism? Describe an activity to demonstrate phototropism.

OR

(a) Write an activity to show phototropism and geotropism?

(b) What type of movement is shown by mimosa plant leaves when touched with a finger?

25. Name the parts A, B and C shown in the following diagram and state one function of each.



26. In one of his experiments with pea plants, Mendel observed that when a pure tall pea plant is crossed with a pure dwarf pea plant. In the first generation, F_1 only tall plants appear.

(i) What happens to the traits of the dwarf plants in this case ?

(ii) When the F_1 generation plants were self-fertilised, he observed that in the plants of second generation, F_2 both tall plants and dwarf plants were present. Why it happened? Explain briefly.

SECTION-C

Q.no. 27 to 33 are Short Answer Questions.

27. When you mix solution of lead (II) nitrate and potassium iodide,

(i) What is the colour of the precipitate formed? Name the compound involved.

(ii) Write balanced chemical equation for the reaction.

(iii) Is this a double displacement reaction ?

28. Why is fuel oil considered a better fuel than coal in industries? Give any three reasons.

OR

Explain allotropy in carbon?

29. Explain whether an alpha particle will experience any force in a magnetic field if:

(i) it is placed in the field at rest.

(ii) it moves in the magnetic field parallel to field lines.

(iii) it moves in the magnetic field perpendicular to field lines.

30. Give reason for the following:

(i) Why are copper and aluminium wires used as connecting wires?

(ii) Why is tungsten used for filament of electric lamps?

(iii) Why is lead-tin alloy used for fuse wires?

31. (i) Mention the site of exchange of material between the blood and surrounding cells.

(ii) Draw a schematic representation of transport and exchange of oxygen and carbon dioxide.

32. (a) Draw a neat diagram of human brain and label on it the following parts:
(i) Mid brain (ii) Pituitary gland (iii) Cerebellum (iv) Cerebrum
(b) Which is the main thinking part of brain?

33. (i) What is meant by a magnetic field? Mention two paramenters that are necessary to describe it completely.
(ii) If field lines of a magnetic field are crossed at a point, what does it indicate?

OR

What is an electromagnet? How can we determine north and south pole of an electromagnet with the help of magnetised iron bar

SECTION-D

Q.no. 34 to 36 are Long Answer Questions.

34. Give one example in each of the following case:
(a) A base which is not an alkali.
(b) A hydrogen containing compound which is not an acid.
(c) A hydroxide which is highly soluble in water.
(d) An oxide which is a base.
(e) A weak mineral acid.

OR

Write balanced equation to satisfy each statement.
(a) Acid + Active metal $\longrightarrow$ Salt + Hydrogen
(b) Acid + Base $\longrightarrow$ Salt + Water
(c) Acid + Carbonate / Bicarbonate $\longrightarrow$ Salt + Water + Carbon dioxide
(d) Acid + Metal oxide $\longrightarrow$ Salt + Water
(e) Base + Metal $\longrightarrow$ Salt + Hydrogen

35. What activities do you perform that are good for the biosphere? What activities do you perform that harm the biosphere?

36. To construct ray diagrams, two rays of light are generally so chosen that it is easy to determine their directions after reflection from a mirror. Choose two such rays and state the path/ direction of these rays after reflection from a concave mirror. Use these two rays to find the position and nature of the image of an object placed at a distance of 8 cm from concave mirror of focal length 12 cm.

SECTION-E

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

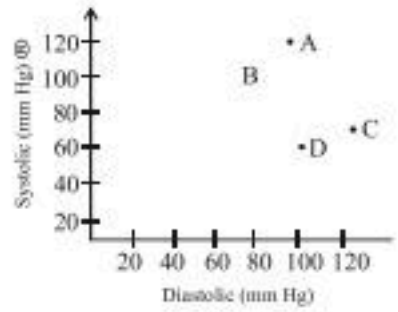
37. Read the following case/passage and answer the questions.
Metals are electropositive elements. They can easily lose electrons to form ions. Metals show distinguished physical as well as chemical properties. Generally most of the metals are ductile and malleable with exception such as mercury. These properties make them valuable for commercial as well as domestic uses. Reaction of a metal with water is one of important chemical property. Metals like sodium and potassium reacts with cold water while magnesium reacts with hot water. Metals like aluminium, zinc do not react with hot/cold water but they easily react with steam. When a metal react with hot/cold water the products are metal hydroxide and hydrogen, and when it react with steam, the product are metal oxide and hydrogen. Some metals like sodium, potassium react violently with water.
(a) Write the chemical reaction of NaAl and Zn with water.
(b) What is ductility?

OR

(b) Al, Cu, Ag, Au – which one is the most ductile metal?

38. Read the following case/passage and answer the questions.
The heart is a tough operating mechanism which moves blood around the body through a very advanced system called arteries and capillaries, the blood is then carried back to the heard by means of veins. Blood pressure is the thrust of this blood in the body pushing up against the inside wall of the arteries as the heart is pumping.
(i) What is the normal Blood pressure range?
(ii) What happens when the decrease in blood volume is greater that 10%?

(iii) Identify the person having normal blood pressure from the graph.

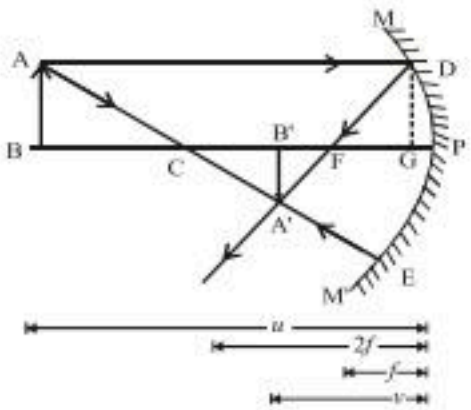


(iv) Why blood pressure changes from aorta to capillaries?

39. Read the following case/passage and answer the questions.

A relationship among the object distance (u), the image distance (v) and the focal length (f) of a mirror is called the mirror formula.

The formula is given by $\frac{1}{f}=\frac{1}{u}+\frac{1}{v}$



(a) What is the relation between focal length and radius of curvature?

(b) What are the possible positions of an object in front of concave mirror to get enlarged image.

(c) According to sign conventions for mirrors what sign is given to image distance?

OR

Magnification of a mirror is always less than 1, which mirror is this?

Solution

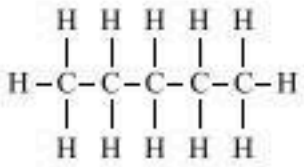
SAMPLE PAPER-3

1. **(c)**

2. **(d)** Antacids contain weak base like $Mg(OH)_2$ and pH paper turns greenish blue for weakly basic compound.

3. **(a)**

4. **(c)**



Pentane has 16 covalent bonds
(12C – H and 4C – C bonds)

5. **(a)** Cu does not produce hydrogen gas on reaction with hydrochloric acid. Cu is present below hydrogen in reactivity series, i.e. it is less reactive than hydrogen.

6. **(a)** $CaCO_3 \xrightarrow{\Delta} CaO + CO_2$

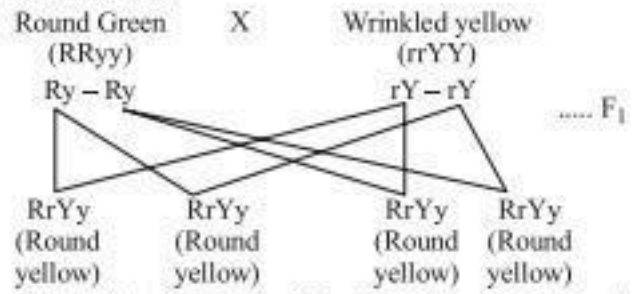
7. **(b)** $\underset{(A)}{HCl} + \underset{(B)}{Na_2CO_3} \longrightarrow \underset{(C)}{NaCl(aq)} + \underset{(D)}{CO_2} + H_2O$

$$CO_2 + NH_3 + NaCl(aq) \longrightarrow \underset{\text{Baking soda}}{NaHCO_3} + NH_4Cl$$

Hence A & B are HCl and Na_2CO_3

8. **(a)** When we breathe in, we lift our ribs and flatten our diaphragm, and the chest cavity becomes larger as a result. Because of this, air is sucked into the lungs and fills the expanded alveoli.

9. **(d)**



Thus, in the first generation (F_1), all seeds would be round and yellow.

10. **(d)** The sequence of events that takes place in a reflex action is as follows–

Receptor organ → Sensory neuron → CNS → Motor neuron → Effector muscle.

11. **(c)** The following step for this experiment are-

(i) Take two healthy potted plants which are nearly the same size.

(ii) Keep them in a dark room for three days.

(iii) Now place each plant on separate glass plates. Place a watch-glass containing potassium hydroxide by the side of one of the plants. The potassium hydroxide is used to absorb carbon dioxide.

(iv) Cover both plants with separate bell-jars.

(v) Use Vaseline to seal the bottom of the jars to the glass plates so that the set-up is air-tight.

(vi) Keep the plants in sunlight for about two hours.

(vii) Pluck a leaf from each plant and check for the presence of starch as in the above activity.

12. **(d)** The given figure (d) shows self pollination. The transfer of pollen grains from anther to stigma is called pollination. It is of 2 types self pollination and cross - pollination. In self-pollination, the pollen grains transfer from anther to stigma on the same flower or another genetically similar flower as of the same plant.

13. **(b)**

14. **(b)** The rate of generation of heat, for a given potential difference is, $P = V^2/R$

15. **(c)** 25 cm

16. **(c)** **17.** **(c)** **18.** **(b)**

19. **(c)** Assertion is correct but Reason is incorrect.
Success rate of test tube baby is less than 20%.

20. **(a)** Both Assertion and Reason are correct and the Reason is a correct explanation of Assertion.
According to principle of segregation (first law of mendel), the two factors of a character which remain together in an individual do not get mixed up but keep their identity distinct and separate at the time of gametogenesis. Gametes carry a single factor or allele for a trait. The two Mendelian factors present in the F_1 plants segregate during gamete formation. The principle of segregation is called the principle of purity of gametes because segregation of the two Mendelian factors of a trait results in gametes receiving only one factor out of a pair. As a result gametes are always pure for a character.

21. A, because it is more acidic. [2 marks]

OR

Zn (Zinc) is most reactive and Cu (copper) is least reactive. [2 marks]

22. (i) Potential difference of 1 volt means the amount of work done when a unit charge moves from one point to the other point in an electric field. [1 mark]

(ii) First symbol is variable resistance and second is ammeter. Variable resistance changes the magnitude of current in the circuit, by variation in resistance. Ammeter is used to find current. (1 mark)

OR

Given, Radius (r)= 0.01 cm = 0.01×10^{-2} m.
Resistivity (ρ) = $50 \times 10^{-8} \Omega$ m.
Resistance (R) = 10Ω

As we know, $\left[\because A = \pi r^2\right]$

$R = \rho\frac{l}{A} = \rho\frac{l}{\pi r^2}$ (1 mark)

$\Rightarrow l = \frac{R\pi r^2}{\rho} = \frac{10\times3.14\times0.01\times10^{-2}\times0.01\times10^{-2}}{50\times10^{-8}}$

$= \frac{314\times10^{-4}}{50\times10^{-8}\times10^{5}}$

Length = $\frac{6.28\times10^{-4}}{10^{-3}} = 0.628$ m. (1 mark)

23. (a) The menstrual cycle lasting 28- 30 days can be divided into four main phases : -

(i) Menstrual Phase. (ii) Follicular Phase.

(iii) Ovulatory Phase. (iv) Luteal Phase.

[4 × ¼= 1 mark]

(b)

	Menarche	Menopause
1.	It is the onset of menstruation is females.	It is the stoppage of menstruation in females.
2.	It occurs at age of 10 to 12 yrs.	It occurs at the age of 45 to 50 yrs.

[2 × ½ = 1 mark]

24. (a) **Phototropism:** It is the growth which responds to a light stimulus. The cells on the plant that are farthest from the light have a chemical called auxin that reacts when phototropism occurs.

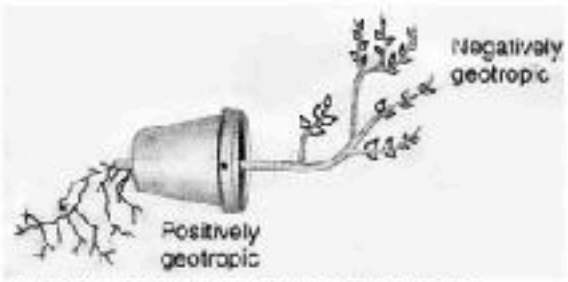
Geotropism: The movement of plant part in response to gravity is called geotropic movement and the phenomenon involved is known as geotropism.

When the tip of the stem grows away from the earth's gravitational forces, it is known as negative geotropism and when the root tips grow towards gravity, it is known as positive geotropism.

Stem shows negative geotropism and roots show positive geotropism.

In the figure below roots are positively geotropic while shoot part in negatively geotropic.

[2 × ½ = 1 mark]



Activity to demonstrate phototropism:

(a) (i) Fill a conical flask with water.

(ii) Cover the neck of the flask with a wire mesh.

(iii) Keep two or three freshly germinated bean seeds on the wire mesh.

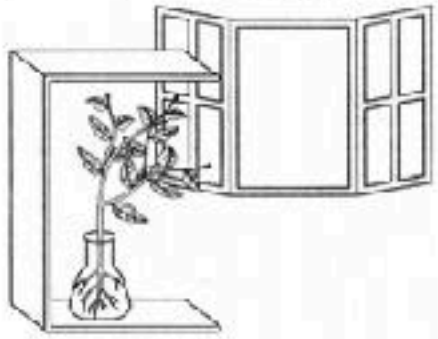
(iv) Take a cardboard box which is open from one side.

(v) Keep the flask in the box in such a manner that the open side of the box face light coming from a window.

(vi) After two or three days, it can be noticed that the shoots bend towards light and roots away from light.

(vii) Now turn the flask so that the shoots are away from light and the roots towards light.

(viii) Leave it undisturbed in this condition for a few days.



[1½ mark]

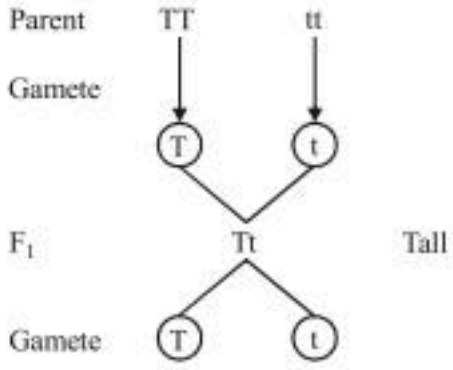
(b) Folding up of the leaves of *Mimosa* plant is an example of each. (½ mark)

25. A. **Anther :** It produces pollen granis.[1½ + ½ = 2 marks]

B. **Style :** It provides the path through which the pollen tube grows and reaches the ovary.

C. **Ovary:** It contains ovules and each ovule has an egg cell/female gamete. It develops into fruit after fertilization.

26. (i)



The dwarf trait of the plants does not gets expressed in the presence of the dominants tall trait.

F_2 TT Tt tt [1 mark]
Tall Tall Dwarf

(ii) In the F_2 generation, both the tall and dwarf traits are present in the ratio of 3 : 1. This shows that the traits for both tallness and dwarfness are present in the F_1 generation, but the dwarfness, the recessive trait does not express itself in the presence of tallness the dominant trait. [1 mark]

27. (i) The colour of precipitate formed is yellow. The name of the compound is lead (II) iodide having the formula PbI_2. [1 mark]

(ii) $Pb(NO_3)_2(aq) + 2KI(aq) \longrightarrow PbI_2(s) + 2KNO_3(aq)$
yellow ppt. [1 mark]

(iii) Yes, it is a double displacement reaction. [1 mark]

28. (a) Fuel oil has higher calorific value than coal.
(b) Fuel oil produces less smoke than coal.
(c) Fuel oil is more efficient than coal. [3 × 1 = 3 marks]

OR

The property due to which an element exists in two or more forms, which differ in their physical and some of the chemical properties is known as "Allotropy" and the various forms are called "Allotropes".

Carbon exists in two allotropic form (i) crystalline (ii) amorphous. The crystalline forms are diamond and graphite whereas the amorphous forms are coal, charcoal, lamp black etc. [3 marks]

29. (i) No, Since, a charged particle at rest in magnetic field. It does not interact with magnetic field. [1 mark]

(ii) No, because, when current and field are parallel i.e. in the same direction magnetic force is zero. [1 mark]

(iii) Yes, because, the force is maximum when current and magnetic field are maximum. [1 mark]

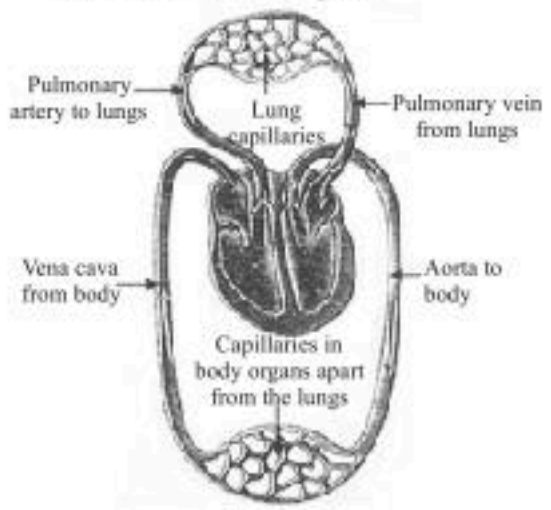
30. (i) these are good conductors of electricity because having low resistance or low resistivity. [1 mark]

(ii) Very high melting point and high resistivity. [1 mark]

(iii) Low melting point. [1 mark]

31. (i) Capillaries [½ mark]

(ii) Refer to below figure.



[½ mark]

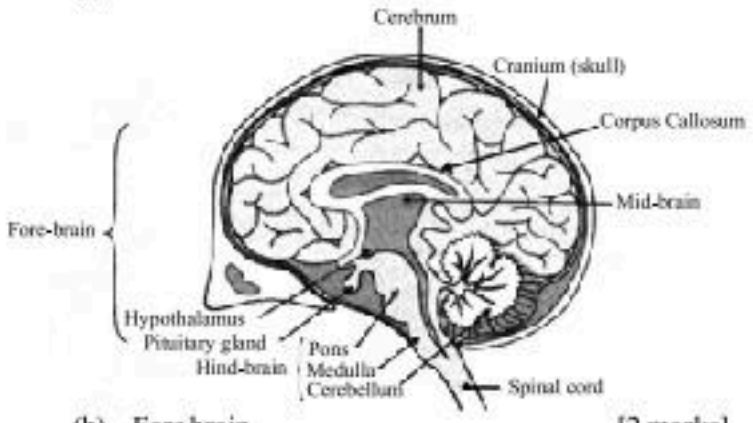
Schematic representation of transport and exchange of oxygen and carbon dioxide

Overview :

(i) The smallest vessels have walls which are one-cell thick, called capillaries. Exchange of material between the blood and surrounding cells takes place across this thin wall. [1 × 2 = 2 marks]

(ii) Schematic representation of transport and exchange of oxygen and carbon dioxide.

32. (a)



(b) Fore brain, [2 marks]

33. (i) The space around the magnet or currernt carrying conductor within which its influence i.e. force of magnetism can be felt by the magnetic field. [1 mark]
Magnitude and direction describe it completely. [1 mark]

(ii) It indicate that at the point of intersection,compass needle would point to two directions which is impossible. [1 mark]

OR

An electromagnet is a solenoid coil that attains magnetism due to flow of current. It works on the principle of magnetic effect of current. [1 mark]

(i) By suspending magnetised bar and identify its north and south poles.

(ii) By finding the polarity of electromagnet using the property-like poles repel. [2 × 1 = 2 marks]

34. (a) Ammonia (NH_3)
(b) Ethanol (C_2H_5OH)
(c) Sodium hydroxide (NaOH)
(d) Calcium oxide (CaO)
(e) Carbonic acid (H_2CO_3) (1 × 5 = 5 marks)

OR

(a) $2HCl(aq) + 2Na(s) \longrightarrow 2NaCl(s) + H_2(g)\uparrow$
(b) $HCl(aq) + NaOH(aq) \longrightarrow NaCl(aq) + H_2O(l)$
(c) $Na_2CO_3(s) + 2HCl(aq) \longrightarrow 2NaCl(aq) + H_2O(l) + CO_2(g)\uparrow$
(d) $2HCl(aq) + Na_2O(s) \longrightarrow 2NaCl(aq) + H_2O(l)$
(e) $2NaOH(aq) + Zn(s) \longrightarrow Na_2ZnO_2(s) + H_2(g)\uparrow$
[1 × 5 = 5 marks]

35. Some examples of actions that are good for the global environment: reducing the quantity of nonfood items purchased; reuse items until they are no longer usable; buy used items rather than getting everything new. Recycling paper, plastic, glass, and metal use of reusable cloth bags when shopping. Plant trees and other native plants, especially those that help feed the native wildlife. Reducing water use by not leaving water running when brushing teeth, by adjusting the water level of washing machines to match the size of the load, and by using water-saving fixtures. Reducing fossil fuel use by choosing a gas-efficient car and by using household heating and air conditioning only as needed. Use of compact fluorescent light bulbs, and turning off lights that are not in use. Supporting organic farmers by purchasing organically grown food. Some examples of actions that are harmful for the global environment: Use of nonrecyclable products and products that are not from recycled sources. Driving alone rather than carpooling or taking public transportation. Use of a gas or electric-powered lawn mower. Make excessive purchases of non-essential items (gadgets, many sets of clothes, extra cars, vacation homes, etc.). Driving a low-mileage vehicle, such as a sport utility vehicle or truck, out of choice, not necessity. [5 marks]

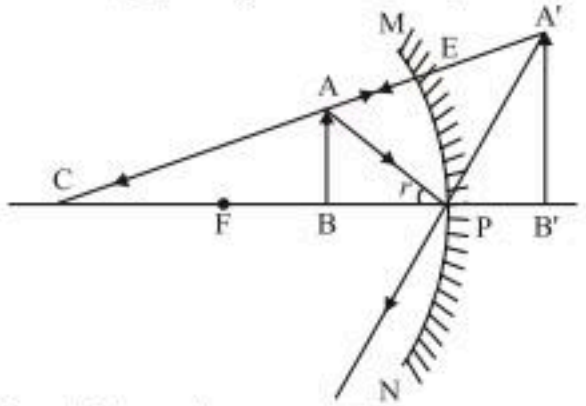
36. We can choose any two of the following rays:

(i) A ray parallel to the principle axis, after reflection, will pass through the principle focus of concave mirror.

(ii) A ray passing through the principle focus of a concave mirror after reflection will emerge parallel to the priniple axis.

(iii) A ray passing through the centre of curvature of a concave mirror after reflection is reflected back along the same path.

(iv) A ray incident obliquely to the principle axis towards the pole of a concave mirror is reflected obliquely, making equal angles with the principal axis. [2 marks]



Rays which are choosen such that

Path of these ray s after reflection:

(i) A ray parallel to the principal axis after reflection, it will pass through the prinipal focus of a concave mirror or appear to diverge in case of a convex mirror.

(ii) A ray passing through the centre of curvature of a concave mirror or appear to pass through the centre of curvature of convex mirror. after reflection, it is reflected back along the same path. [2 marks]

$f = -12$ cm, $u = -8$ cm

we know, $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$

$\frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{-12} - \frac{1}{-(8)}$

$= \frac{3-2}{24} = \frac{1}{24} = 24$ cm

$v = +ve$, So image is virtual and is formed at a distance of 24 cm behind the mirror. [1 mark]

37. (a) (i) $Na(s) + H_2O(l) \rightarrow NaOH(aq) + H_2(g)$ [1 mark]

(ii) $2Al(s) + 3H_2O(g) \rightarrow Al_2O_3(s) + 3H_2(g)$ [1 mark]

(iii) $Zn(s) + H_2O(g) \rightarrow ZnO(s) + H_2(g)$ [1 mark]

(b) Metals can be converted into thin sheet by hammering. This property is known as ductile. [1 mark]

OR

Gold is the most ductile metal. [1 mark]

38. (i) 120/80 mm Hg is normal blood pressure range. [1 mark]

(ii) Less of approximately 10% of blood volume can occur without a decrease in blood pressure or cardiac output. [1 mark]

(iii) The person C. [1 mark]

(iv) This is because capillaries are less in diameter. [1 mark]

39. (a) Focal length = $\frac{\text{Radius of curvature}}{2}$ [1 mark]

(b) (i) within focus, (virtual) (ii) at focus , (real) (iii) between C and F.(real) [2 marks]

(c) (i) for real image → negative,

(ii) for virtual image → positive [1 mark]

OR

Convex [1 mark]