CBSE
Class X Science
Sample Paper 15

Time: 3 hrs **Total Marks: 80**

General Instructions:

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

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

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

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

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

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

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

Section A

1. What is the main advantage of sexual reproduction over asexual reproduction? (1)

OR

Which part of the ovule provides nourishment to the developing embryo?

2. A normal pea plant bearing coloured flowers suddenly start producing white flowers. What could be the possible cause? (1)

3. In which of the following group/groups of animals, heart does not pump oxygenated blood to different parts of the body? (1)

(a) Pisces
(b) Amphibians
(c) Amphibians and reptiles
(d) Pisces and amphibians

4. What will you observe when blue litmus is introduced into a solution of ferric chloride. (1)

OR

Write the name and formula of one salt each which contains ten molecules of water of crystallisation.

5. Name two metals which can displace hydrogen from dilute acids. (1)

6. Translate the following statements into chemical equation and then balance the equation:
Barium chloride reacts with zinc sulphate to give zinc chloride and barium sulphate. (1)

7. Name on natural source of each of the following acids:
(a) Citric acid (b) Oxalic acid (1)

8. Why does carbon form compounds mainly by covalent bonding? (1)

9. A, B and C are the elements of a Dobereiner's triad. If the atomic mass of A is 7 and that of C is 39, what should be the atomic mass of B? (1)

OR

Name two elements whose properties were predicted on the basis of their positions in Mendeleev's periodic table.

10. State Fleming's left-hand rule. (1)

11. If the object is placed at a distance of 15 cm in front of the concave mirror of focal length of 10 cm, then what will be the nature of the image? (1)

OR

How is the linear magnification produced by concave mirror?
(A) less than 1 or equal to 1
(B) zero or 1
(C) more than or equal to 1
(D) less than 1, more than 1 or equal to 1

12. Positively charged particles moving towards the west are deflected towards the north by a magnetic field. What will be the direction of the magnetic field? (1)

OR

What is electromagnetic induction?

13. What is meant by saying that the electric potential at a point is 1 volt? (1)

For question numbers 14, 15 and 16, two statements are given—one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

a) Both A and R are true, and R is the 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 true, but R is false.
d) A is false, but R is true.

14. **Assertion**: Bile helps in the emulsification of fats. (1)
Reason: Bile makes acidic food coming from the stomach alkaline so that pancreatic enzymes can act on it.

15. **Assertion**: Sunlight reaches us without dispersion in the form of white light and not as its components.
Reason: Dispersion takes place due to variation of refractive index for different wavelength but in vacuum the speed of light is independent of wavelength and hence vacuum is non – dispersive. (1)

OR

Assertion: Stars appear to be twinkling and planets do not twinkle.
Reason: The blue colours scatters much more than the red colour by air particles.

16. **Assertion:** Freely suspended current carrying solenoid comes to rest in N-S direction just like a bar magnet.
Reason: On one end of current carrying straight solenoid behaves as a North pole and other end as a South pole. (1)

Answer Q. No 17 - 20 contain five sub-parts each. You are expected to answer any four subparts in these questions.

17. Read the following and answer any four questions from 17(i) to 17(v) (1×4)
When a spherical mirror is held towards the sun and its sharp image is formed on a piece of carbon paper for some time, a hole is burnt in the carbon paper. Answer the following questions in reference to the above activity.

(i) What is the nature of spherical mirror?
a) Convex mirror
b) Concave mirror
c) Plane mirror
d) Plano convex mirror

(ii) Why is a hole burnt in the carbon paper?
a) Sun rays are dispersed by the spherical mirror
b) The Sun's heat rays are concentrated at the point of sun's image
c) Sun rays get diverged after reflection from spherical mirror
d) Due to atmospheric refraction

(iii) At which point of the spherical mirror the carbon paper is placed?
a) Between pole and focus
b) Between centre of curvature and focus
c) Anywhere between infinity and focus
d) At focus

(iv) What name is given to the distance between spherical mirror and carbon paper?
   a) Image distance
   b) Object distance
   c) Focal length
   d) Principal axis

(v) For the above-mentioned spherical mirror, the image formed by it when the object is placed at its centre of curvature is
   a) Twice the size of the object
   b) Greater than size of object
   c) Equal to the size of the object
   d) Less than the size of the object

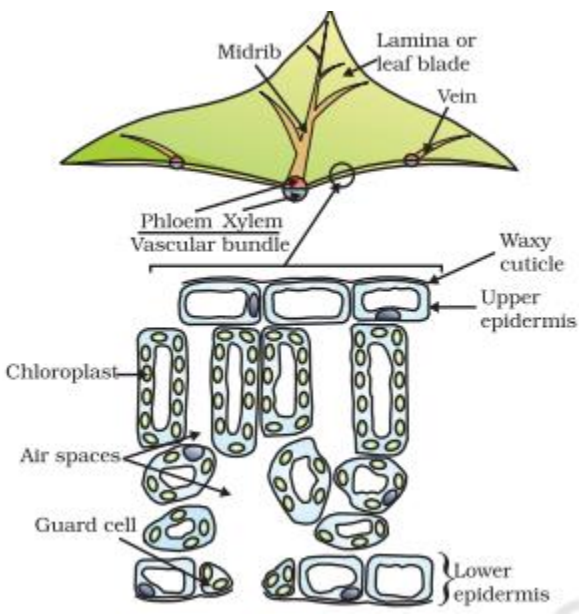
18. Read the following and answer any four questions from 18 (i) to 18 (v). (1×4)

Carbon and energy requirements of the autotrophic organism are fulfilled by photosynthesis. It is the process by which autotrophs take in substances from the outside and convert them into stored forms of energy.

(i) Which of the following acts as an internal energy reserve in plants?
   a) Starch
   b) Glycogen
   c) Chitin
   d) Cellulose

(ii) Which of the following processes are not a part of the process of photosynthesis?
   a) Absorption of light energy by chlorophyll
   b) Conversion of light energy to chemical energy and splitting of water molecules
   c) Oxidation of carbon dioxide to carbohydrates
   d) Reduction of carbon dioxide to carbohydrates

(iii) Which of the following structures is absolutely essential for the process of photosynthesis?



a) Lower epidermis
b) Chloroplasts
c) Phloem
d) Waxy cuticle

(iv) The following experiment proves that

a) Light is necessary for photosynthesis
b) Carbon dioxide is necessary for photosynthesis
c) Chlorophyll is necessary for photosynthesis
d) Oxygen is necessary for photosynthesis

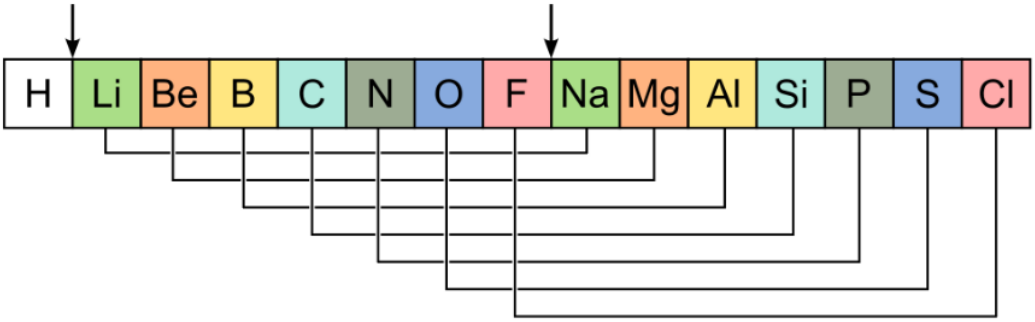
(v) What is the role of stomata in process of photosynthesis?
a) Gaseous exchange
b) Absorption of light
c) Transfer of nutrients
d) Emission of light

19. Read the following and answer any four questions from 19 (i) to 19 (v). (1×4)

Newlands' Law of Octaves

In 1864, Newlands arranged the known 56 elements in the order of increasing atomic masses. He observed that the properties of every eighth element are similar to the properties of the first element. Based on this observation, he proposed the Law of Octaves for the classification of elements.

Law of Octaves: When the elements are arranged in the increasing order of their atomic masses, the properties of every eighth element are similar to the first.



Many limitation were found in Newlands' octaves. This law was found to be applicable only up to calcium. Newlands fitted all the known elements in a table of 7 X 8 that is 56 boxes. Newlands placed two elements each in some boxes to accommodate all the known elements in the table. For example, Co and Ni, Ce and La. Moreover, he placed some elements with different properties under the same note in the octave. For example, Newlands placed the metals Co and Ni under the note 'Do' along with halogens, while Fe, having similarity with Co and Ni, away from them along with the nonmetals O and S under the note 'Ti'. Also, Newlands' octaves did not have provision to accommodate the newly discovered elements. The properties of the new elements discovered later on did not fit in the Newlands' law of octaves.

(i) Newland's rule known as _____ .
   a) Law of triad
   b) Law of octave
   c) Law of periodic table
   d) Periodic law

(ii) Newland's law of octaves based upon_____ .
   a) Increasing order of atomic number
   b) Increasing order of atomic mass
   c) Increasing order of electron
   d) Increasing order of atomic size

(iii) Newland's law of octaves is applicable to _____ .
   a) Sodium
   b) Magnesium
   c) Calcium
   d) Sulphur

(iv) A and B are two elements having similar properties which obey the law of octave. How many elements are there in between A and B?
   a) 6
   b) 7
   c) 8
   d) 5

(v) Which of the following is true regarding Newland's Law of Octaves?
   a) It worked well with only lighter elements.
   b) It was applicable only up to calcium.
   c) Both are correct.
   d) Both are incorrect.

20. Read the following and answer any four questions from 19 (i) to 20 (v). (1×4)

Sample of five metals 'A', 'B', 'C', 'D' and 'E' was taken and added to the following solution one by one. The results obtained have been tabulated as follows.

Metal	$FeSO_4$	$CuSO_4$	$ZnSO_4$	$AgNO_3$	$Al_2(SO_4)_3$	$MgSO_4$
A	No reaction	Displacement	No reaction	Displacement	No reaction	No reaction
B	Displacement	Displacement	No reaction	Displacement	No reaction	No reaction
C	No reaction	No reaction	No reaction	Displacement	No reaction	No reaction
D	No reaction	No reaction	No reaction	No reaction	No reaction	No reaction
E	Displacement	Displacement	Displacement	Displacement	No reaction	No reaction

Use the above table to answer the following questions about the given metals.

(i) Which of them is most reactive?

(a) A
(b) B
(c) D
(d) E

(ii) What would you observe if 'B' is added to $CuSO_4$?

(a) Reddish brown deposit
(b) Grey deposit
(c) Greyish silver deposit
(d) Black deposit

(iii) Arrange 'A', 'B', 'C', 'D' and 'E' in the increasing order of reactivity.

(a) E>A>B>C>D
(b) E>B>A>D>C
(c) E>B>A>C>D
(d) C>D>A>E>B

(iv) Container of which metal can store zinc sulphate and silver nitrate solution?

(a) A
(b) B
(c) C
(d) D

(v) Which of the above solution(s) can be stored in a container made of any of these metals?

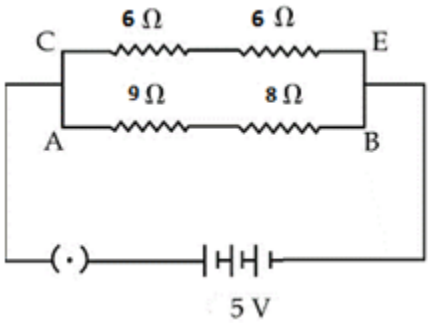
(a) Aluminium sulphates
(b) Magnesium sulphates
(c) Both (a) & (b)
(d) None of these

Section B

21. Distinguish between a bar magnet and an electromagnet. (2)

OR

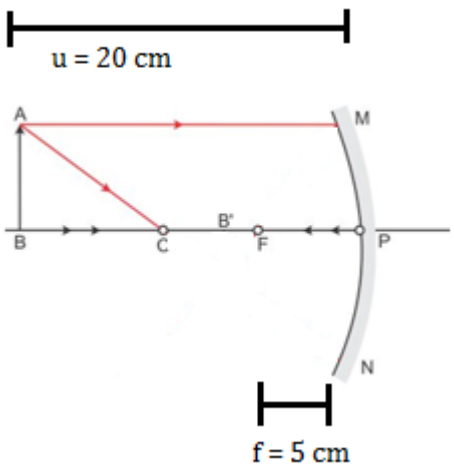
Study the circuit and find the



(i) Total resistance in arm CE

(ii) Current in arm AB

22. Observe the diagram and answer the questions based on the studied concepts.



(i) Complete the given ray diagram.

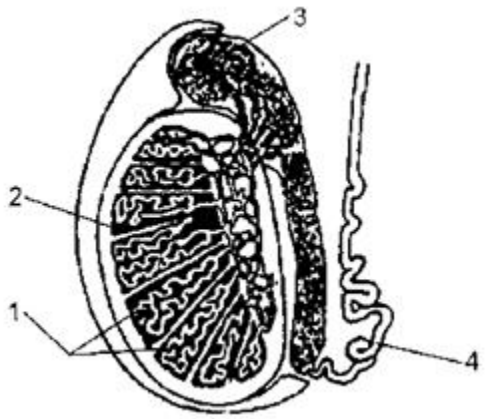
(ii) Calculate the position of the image formed. (2)

23. Why do fish die when taken out of water? (2)

OR

What is the role of HCl in our stomach?

24. Given below is a diagram of the lateral section of the human testis. Study the same and answer the questions which follow: (2)



(i) State the functions of the parts labelled 1 and 3.
(ii) What is the significance of the testes being located in the scrotal sac outside the abdomen?

25. What will you observe when (3)
(a) Red litmus is introduced into a solution of sodium sulphate.
(b) Methyl orange is added to dil. HCI.

26. Write the name and formula of one salt each which contains (3)
(a) two molecules of water of crystallisation
(b) five molecules of water of crystallisation

Section C

27. Describe the concept of trophic levels. (3)

OR

The tongue has different areas for detecting different tastes, but we do not have to place each substance at that area to know the taste. Why?

28.
(a) What are the patterns formed by the circular loop carrying current?
(b) Which rule is used to find the direction of the magnetic field produced due to the electric current in a circular loop?
(c) On which factors does the strength of a magnetic field depend? (3)

29.
(a) What is the nature of the image formed by a convex mirror when the object is placed between the pole and infinity?
(b) What is diffused reflection of light?
(c) Which mirror is used as a rear-view mirror? Why? (3)

30. Explain the result of a monohybrid cross. (3)

31. Why does blood in the arteries flow with jerks and is under pressure? (3)

32. What is vegetative propagation? State two advantages and two disadvantages of this method. (3)

33. Explain giving one example for each of the following chemical reactions:
(a) Double decomposition reaction
(b) Thermal decomposition reaction
(c) Displacement reaction

Section D

34. (5)
(a) Draw a neat diagram of the respiratory system and label the following parts:
(i) Lungs, (ii) Trachea, (iii) Bronchus, (iv) Diaphragm
(b) Name the respiratory pigment in human beings and discuss its role.
(c) Why is the rate of breathing in aquatic organisms faster than that in terrestrial organisms?

OR

(a) Which device prevents implantation by irritating the lining of the uterus?
(b) What could be the possible reason for the declining female–male sex ratio in our country? Suggest two measures to achieve the 1:1 ratio.

35. A circuit has a fuse of 5 A. What is the maximum number of 110 W (220 V) bulbs that can be safely used in the circuit? (5)

36.
(a) Name a metal which does not stick to glass. (5)
(b) Name a non-metal which is a good conductor of electricity.
(c) Name a metal which is commonly used in thermite welding.
(d) What is deposited at the cathode, a pure or impure metal?
(e) What is the nature of zinc oxide?

OR

The following table shows the position of six elements A, B, C, D, E and F in the periodic table. [5]

Group / Period	1	2	3 to 12	13	14	15	16	17	18
2	A					B			C
3		D			E				F

Using the above table, answer the following questions:
(a) Which element will form only covalent compounds?
(b) Which element is a metal with valency 2?
(c) Which element is a non-metal with valency 3?
(d) Out of D and E, which one has a larger atomic radius and why?
(e) Write the common name for the family of elements C and F.

CBSE
Class X Science
Sample Paper 15 – Solution

Section A

1. Sexual reproduction brings about variation in individual. Also, it ensures survival of species in a population.

OR

Nucellus is a mass of parenchymatous cells, which is surrounded by integuments. It encloses the embryo sac and provides nutrition to the developing embryo.

2. The appearance of white flowers is due to mutation.

3. (a) In Pisces heart does not pump oxygenated blood to different parts of the body.

4. $FeCl_3$ solution on reacting with water will form ferric hydroxide and hydrochloric acid. Since the acid is strong, the solution will be acidic. Therefore, the colour of blue litmus will change to red.

OR

Sodium carbonate decahydrate, commonly known as washing soda, has the formula $Na_2CO_3.10\ H_2O$.

5. Sodium and magnesium.

6. $BaCl_2 + ZnSO_4 \longrightarrow ZnCl_2 + BaSO_4$

7. (a) Citric acid - Lemon.
(b) Oxalic acid - Tomatoes.

8. Carbon forms covalent bonds because it can achieve the inert gas electron arrangement only by sharing of electrons.

9. $\text{Mass of B} = \frac{7 + 39}{2} = 13$

OR

Gallium and Scandium are elements whose properties were predicted on the basis of their positions in Mendeleev's periodic table.

10. According to Fleming's left-hand rule, hold the forefinger, the middle finger and the thumb of your left hand at right angles to one another. Adjust your hand in such a way that the forefinger points in the direction of the magnetic field and the middle

finger points in the direction of current. The direction in which the thumb points gives the direction of force acting on the conductor.

11. The object is placed at 15 cm; this means that the object is placed between the focus and the centre of curvature of the concave mirror. When the object is placed between the focus and the centre of curvature of a concave mirror, the image formed is real, inverted and magnified.

OR

(D) less than 1, more than 1 or equal to 1

Linear magnification produced by a concave mirror may be less than 1, more than 1 or equal to 1.

12. As the **positively charged** particles are moving towards the west, the direction of current will be towards the west. Hence, the direction of the magnetic field is in the upward direction.

(**Explanation**: -

It is given that the deflection is towards the north. Thus, according to Fleming's left-hand rule, holding the middle finger towards the west (direction of current) and the thumb towards the north (in the direction of force), the forefinger points in the upward direction. Hence, the direction of the magnetic field is in the upward direction.)

OR

The process by which a changing magnetic field in a conductor induces a current in another conductor is called electromagnetic induction.

13. Electric potential at a point is 1 volt means 1 joule of work is done in moving 1unit positive charge from infinity to that point.

14. b) Both A and R are true, but R is not the correct explanation of the assertion. Bile is a greenish yellow liquid secreted by the liver in the small intestine. It contains bile pigments, bile salts, cholesterol and phospholipids. It breaks down large fats into smaller globules by a process called emulsification. They also help in incorporating fatty acids and glycerol into small, spherical, water-soluble molecules called micelles.

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

In vacuum the speed of light is independent of wavelength and hence no dispersion takes place in vacuum. Thus, vacuum is a non – dispersive medium where all colours travels with a same speed.

OR

b) Both A and R are true but R is not correct explanation of A.

Stars twinkle due to phenomenon of atmospheric refraction while the planets are much closer to earth and are seen as extended sources.

16. b) Both A and R are true and R is not correct explanation of A.
Assertion statement tells the relation between Earth's geographical N-S pole and magnetic N-S pole whereas reason statement gives the property of solenoid.

17.

(i) b) Concave mirror
Nature of spherical mirror is concave.

(ii) b) The Sun's heat rays are concentrated at the point of sun's image
A lot of sun's heat rays are concentrated at the point of sun's image which burn the hole in carbon paper.

(iii) d) At focus
carbon paper must be placed at the focus of the concave mirror as the light rays will get concentrated at that point and thus burn the paper.

(iv) c) focal length
As the carbon paper is at focus, the distance between spherical mirror and carbon paper will be called focal length.

(v) c) equal to the size of the object
The image formed by concave mirror when object is placed at the centre of curvature is real, inverted and of same size as that of the object.

18.

(i) a) The carbohydrates which are not used immediately are stored in the form of starch, which serves as the internal energy reserve to be used as and when required by the plant.

(ii) c) During photosynthesis, there is reduction of carbon dioxide to carbohydrates in the form of glucose.

(iii) b) Chloroplasts contain chlorophyll pigment which traps sunlight for photosynthesis.

(iv) c) The variegated leaf experiment proves that chlorophyll is necessary for photosynthesis.

(v) a) Stomata assist in the process of massive gaseous exchange during photosynthesis.

19.

(i) b) Newland's rule known as 'law of octave'.

(ii) b) Newland's law of octaves based upon increasing order of atomic mass.

(iii) c) Newland's law of octaves is applicable to calcium.

(iv) a) 6 elements are there in between A and B.

(v) c) Both the statements are correct. Hence, option C is correct.

20.

(i) (d) E is most reactive. Because it react with most substances.

(ii) (a) Reddish brown deposit of copper will be formed since displacement has taken place.

(iii) (c) E>B>A>C>D reason: The more it reacts the more reactive it is. Just count a number of displacements a metal will give.

(iv) (d) Container of metal D can be used for this purpose as it does not react with any of them.

(v) (c) Aluminium and magnesium sulphates can be used to store in any container because the react with none.

Section B

21.

Bar magnet	Electromagnet
1. A bar magnet is a permanent magnet.	1. An electromagnet is a temporary magnet.
2. A permanent magnet produces a comparatively weak force of attraction.	2. An electromagnet can produce a very strong magnetic force.
3. The strength of a permanent magnet cannot be changed.	3. The strength of an electromagnet can be changed by changing the number of turns in the coil or changing the current passing through it.
4. The polarity of a permanent magnet is fixed and cannot be changed.	4. The polarity of an electromagnet can be changed by changing the direction of current.

OR

(i) Total resistance in arm CE

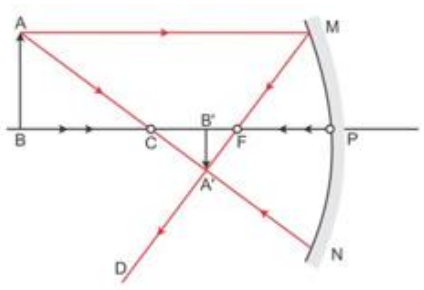
$R_s = 6 + 6 = 12\ \Omega$

(ii) Current in arm AB

$$I = \frac{5\ V}{17\ \Omega} = 0.29\ A$$

22.

(i)



Object beyond C

(ii) We know,

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

$v = ?, f = -5$ cm (focal length of concave mirror)

$u = -20$ cm

$$\therefore \frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{-5} - \frac{1}{-20} = \frac{-15}{100}$$

$\therefore v = -6.67$ cm

Thus, the image is formed at a distance of 6.67 cm between the centre of curvature and the focus.

23. Fish utilise the oxygen dissolved in water for their respiration. When fish are taken out of water, the supply of oxygen to the fish is cut as they cannot absorb and breathe using the oxygen present in the atmosphere. Hence, the fish die after some time.

OR

HCl makes the medium inside the stomach acidic, which is necessary for the activation of enzyme pepsin. It converts inactive propepsin into active pepsin. Hydrochloric acid kills the bacteria, which may enter the stomach along with food.

24.

(i) 1: Seminiferous tubules: Produce sperm by the process of spermatogenesis.
3: Epididymis: Stores sperm for some days during which they mature and become motile.

(ii) The production and survival of sperm require a temperature which is lower than the normal body temperature. So, the testes are located in the scrotal sac which is outside the abdomen to maintain the temperature at 3°C below the normal body temperature.

25.

(a) It will not undergo any colour change because the solution of Na_2SO_4 in water is almost neutral.

(b) In the acidic solution, the colour of methyl orange will change to reddish.

26.

(a) Calcium sulphate dihydrate, commonly known as gypsum, has the formula $CaSO_4.2\ H_2O$.

(b) Copper sulphate pentahydrate, commonly known as blue vitriol, has the formula $CuSO_4.5\ H_2O$.

Section C

27. In a food chain, trophic levels are consecutive steps followed in the process of energy flow, and each step or level is dependent on the other for food. Different trophic levels are

- Producers: They form the first trophic level and are able to manufacture their own food (green plants).
- Primary consumers: They form the second trophic level and are generally plant eaters (herbivores).
- Secondary consumers: They form the third trophic level and are flesh eaters (carnivores).
- Tertiary consumers: They form the fourth trophic level and feed on secondary consumers.

OR

The tongue detects tastes through tiny organs called taste buds, containing gustatory receptors. Particular chemicals in food dissolve in the saliva and stimulate gustatory receptors in specific taste buds. Since the chemicals dissolve in the saliva, they spread throughout the surface of the tongue.

28.

(a) The circular loops carrying current forms concentric circular patterns of the magnetic field due to electric current.

(b) The direction of the magnetic field of the loop carrying current can be determined by the clock face rule.

(c) The strength of the magnetic field due to current depends on the

i) number of turns of wire in the coil

ii) radius of the coil

iii) current flowing in the coil

29.

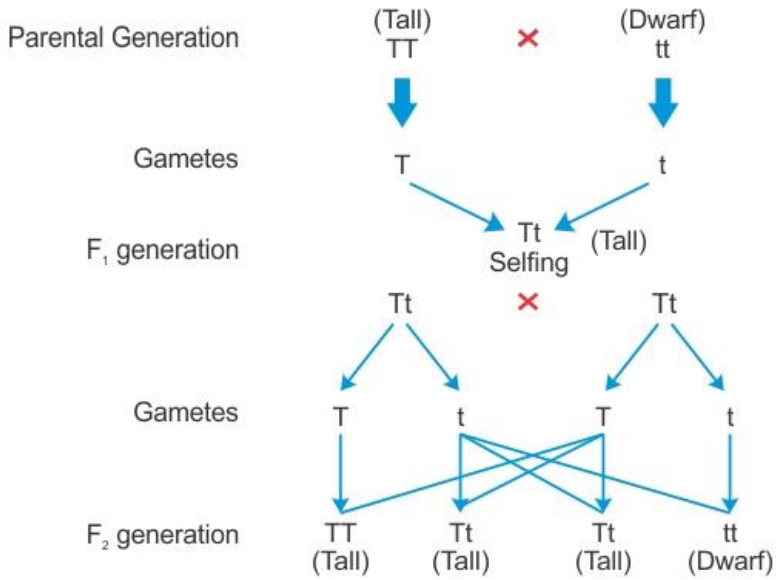
(a) When an object is placed between the pole and infinity, the image formed is virtual, erect and diminished.

(b) When light rays are incident on the rough surface, they are reflected in different directions. This type of reflection is called diffused reflection or irregular reflection.

(c) A convex mirror always produces an erect, virtual and diminished image. This enables a driver to view a much larger area behind him. Hence, a convex mirror is suitable as a rear-view mirror.

30. <u>Monohybrid cross:</u>

- Monohybrid cross involves only a single pair of contrasting characters.
- Consider pea plants with a pair of contrasting characters—tallness and dwarfness—with respect to the height of the stem.
- If pure tall pea plants (TT) are crossed with pure dwarf pea plants (tt), then all progeny plants obtained will be tall. This is called the first filial or F_1 generation seeds.
- The F_1 generation has genetic constitution Tt. It is genotypically a hybrid and a heterozygous plant with two different alleles.
- Phenotypically, the plant is tall because the allele or the gene T for tallness masks the effect of its corresponding recessive gene t.



- F_1 plants are self-pollinated to obtain the F_2 generation.
- The second filial generation F_2 has a genotypic ratio 1 TT:2 Tt:1 tt.
- In this case, because the allele T for tallness is dominant, the pea plants with genotype Tt will be tall.
- The phenotypic ratio is 3 tall:1 dwarf.
- Genotypically, it shows 3 types of plants: 1 TT (which is homozygous tall), 2 Tt (which are heterozygous tall) and 1 tt (which is homozygous dwarf). Thus, the genotypic ratio is 1 TT:2 Tt:1 tt.

31. Blood in the arteries moves because of the pressure of blood from the heart. Each time the heart pumps, it pushes the blood a little further. Veins do not rely on the heart to move blood. Veins have a system of valves to keep the blood from not moving backward, and muscles contract the veins to move the blood.

32. Vegetative propagation is a type of reproduction in which several plants are capable of reproducing naturally through the vegetative parts of plants such as roots, stems and leaves.

Advantages of vegetative propagation:

- Plants not capable of reproducing sexually reproduce by this method.
- It is a fast and certain method to obtain plants with desired features.

Disadvantages of vegetative propagation:

- There is no possibility for variation.
- The new plant grows in the same area as the parent plant which leads to competition for resources.

33.

(a) Double decomposition reaction:

This is a type of chemical reaction in which two compounds in a solution react to form two new compounds by the mutual exchange of radicals.

$$NaCl_{(s)} + AgNO_3 \longrightarrow AgCl_{(s)} \downarrow + NaNO_{3(aq)}$$

(b) Thermal decomposition reaction:

A decomposition reaction brought about by heat is known as thermal decomposition.

$$2HgO_{(s)} \xrightarrow{\Delta} 2Hg_{(s)} + O_{2(g)}$$

(d) Displacement reaction:

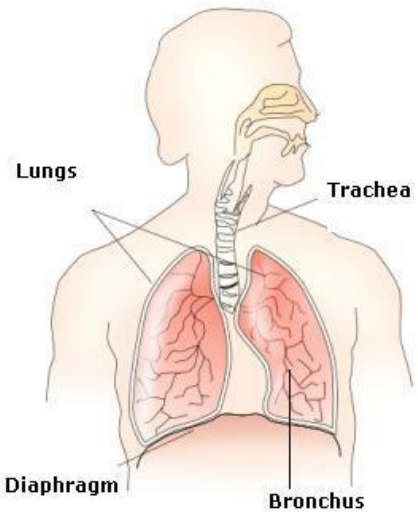
It is a chemical reaction in which a more active element displaces a less active element from its salt solution.

$CuSO_4 + Zn \rightarrow ZnSO_4 + Cu$

Section D

34.

(a) Respiratory system:



(b) Haemoglobin

Role of haemoglobin → It is an iron–protein compound in red blood cells which gives blood its red colour and transports oxygen and carbon dioxide.

(c) The rate of breathing in aquatic organisms is much faster than that in terrestrial organisms because the amount of dissolved oxygen in water is fairly low compared to the amount of oxygen in the air.

OR

(a) Copper-T

(b) The reason for declining females in India is sex-selective abortions of the female foetus through surgeries (female foeticides). This can be avoided by banning pre-natal sex determination. Everyone in society needs to be educated about the equality of gender and the health of women.

35. Suppose 'n' bulbs can be used safely.

Power of 'n' bulbs, P = 110 x n Watt

Potential difference, V = 220 V

Current, I = 5 A

Power, P = V x I

$$110 \times n = 220 \times 5$$

$$n = \frac{220 \times 5}{110} = 10$$

Thus, the maximum number of bulbs which can be connected safely in the circuit is 10.

36.

(i) Mercury

(ii) Graphite

(iii) Aluminum

(iv) A pure metal is always deposited at the cathode.

(v) Zinc oxide (ZnO) is an amphoteric oxide.

OR

(a) Element E will form only covalent compounds.

(b) Element D is a metal with valency 2.

(c) Element B is a non-metal with valency 3.

(d) D, because the atomic size decreases along a period.

(e) Noble gases