

Class 10 - Science**Sample Paper - 07 (2022-23)****Maximum Marks: 80****Time Allowed: : 3 hours****General Instructions:**

- i. This question paper consists of 39 questions in 5 sections.
- ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii. Section A consists of 20 objective type questions carrying 1 mark each.
- iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.
- v. 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.
- vi. 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.
- vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

Section A

1. The taste and smell of food changes when kept for a long time in open. It is called
 - a) Rancidity
 - b) Corrosion
 - c) Oxidation
 - d) Reduction
2. Match the following with the correct response:

Column A	Column B
(i) Shiny non- metal	(a) Mercury
(ii) The metal which melts at room temperature	(b) Gallium
(iii) Soft metal	(c) Iodine
(iv) Liquid metal	(d) Sodium

- a) (i) - (d), (ii) - (a), (iii) - (c), (iv) - (b)
- b) (i) - (c), (ii) - (b), (iii) - (d), (iv) - (a)
- c) (i) - (a), (ii) - (c), (iii) - (b), (iv) - (d)
- d) (i) - (b), (ii) - (d), (iii) - (a), (iv) - (c)

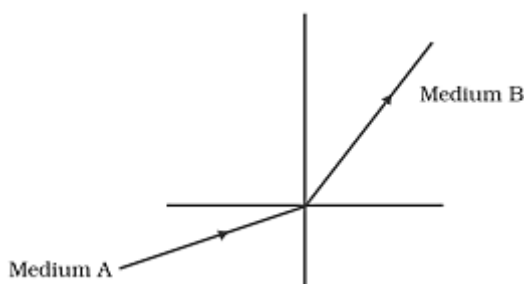
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3. Which is the correct sequence of the components of a reflex arc?
- Receptors → Muscles → Sensory neuron → Motor neuron → Spinal cord
 - Receptors → Motor neuron → Spinal cord → Sensory neuron → Muscle
 - Receptors → Sensory neuron → Spinal cord → Motor neuron → Muscle
 - Receptors → Spinal cord → Sensory neuron → Motor neuron → Muscle
4. Two pink colored flowers on crossing resulted in 1 red, 2 pink, and 1 white flower progeny. The nature of the cross will be
- self pollination
 - double fertilisation
 - no fertilisation
 - cross fertilisation
5. A student has to do the experiment, on finding the focal length of a given concave mirror, by using a distant object. Out of the following setups (A, B, C, D) available to her
- a screen, a mirror holder and a scale
 - a mirror holder, a screen holder and a scale
 - a screen holder and a scale
 - a mirror holder and a screen holder
- a) D
b) C
c) A
d) B
6. Asexual reproduction takes place through budding in
- Leishmania
 - Plasmodium
 - Yeast
 - Amoeba
7. A light ray enters from medium A to medium B as shown in Figure. The refractive index of medium B relative to A will be



- equal to unity
 - less than unity
 - greater than unity
 - zero
8. Which of the following element is essential for the formation of protein
- N
 - Ca

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- c) Na
d) Fe
9. The growth of pollen tubes towards ovules is due to
a) geotropism
b) chemotropism
c) phototropism
d) hydrotropism
10. In a flower, the parts that produce male and female gametes (germ cells) are
a) stamen and style
b) filament and stigma
c) anther and ovary
d) stamen and anther
11. **Statement A:** There are 31 pairs of cranial nerves and 12 pairs of spinal nerves.
Statement B: Ethylene inhibits growth.
a) Statement A is true, B is false
b) Neither statement A nor statement B is true
c) Statement B is true, A is false
d) Both the statement A and B are true
12. Which one of the following elements symbolized as A and B is a metal: ${}_{11}^{23}A, {}_{20}^{40}B?$
a) Neither A nor B is a metal
b) Both A and B are metals
c) A is metal
d) B is metal
13. Which among the following is not the function of testes at puberty?
i. formation of germ cells
ii. secretion of testosterone
iii. development of placenta
iv. secretion of estrogen
a) (i) and (ii)
b) (iii) and (iv)
c) (ii) and (iii)
d) (i) and (iv)
14. Find the incorrect statement about soaps.
a) Fat is hydrolysed with NaOH to get soap.
b) Soaps are acidic in nature.
c) $(C_{17}H_{31}COO)_2Ca$ is the scum.
d) $C_{17}H_{31}COONa$ is a soap.

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15. The correct electron dot structure of a water molecule is
- $\text{H}:\ddot{\text{O}}\cdot\text{H}$
 - $\text{H}:\ddot{\text{O}}:\text{H}$
 - $\text{H}:\ddot{\text{O}}:\text{H}$
 - $\text{H}\cdot\ddot{\text{O}}\cdot\text{H}$
16. Which of the following is the incorrect method of preventing rusting?
- Iron articles should be covered with plastic
 - The machine parts should be oiled or greased
 - Galvanised iron pipes are used for water supply.
 - The iron articles should be painted
17. **Assertion (A):** Weak acids have low electrical conductivity.
Reason (R): Strong acids and weak acid have an equal concentration of hydrogen ions in their solutions.
- Both A and R are true and R is the correct explanation of A.
 - Both A and R are true but R is not the correct explanation of A.
 - A is true but R is false.
 - A is false but R is true.
18. **Assertion (A):** The resistivity of the conductor increases with the increase of temperature.
Reason (R): The resistivity is the reciprocal of the conductivity.
- Both A and R are true and R is the correct explanation of A.
 - Both A and R are true but R is not the correct explanation of A.
 - A is true but R is false.
 - A is false but R is true.
19. **Assertion (A):** The main organ of the human excretory system is the kidney.
Reason (R): Kidneys perform the function of removing excess water and nitrogenous wastes from the body.
- Both A and R are true and R is the correct explanation of A.
 - Both A and R are true but R is not the correct explanation of A.
 - A is true but R is false.
 - A is false but R is true.
20. **Assertion (A):** Bronze is an alloy of lead and tin.
Reason (R): Alloys are a heterogeneous mixture of metals with other metals and non-metals.
- Both A and R are true and R is the correct explanation of A.
 - Both A and R are true but R is not the correct explanation of A.
 - A is true but R is false.
 - A is false but R is true.

Section B

21. What is astigmatism? What causes astigmatism? How is astigmatism corrected?

OR

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What is the role of the ciliary muscles?

22. What are the harmful effects of acid rain?
23. What will happen to a ray of light when it falls normally on a surface? Show it diagrammatically.
24. What are the differences between autotrophic and heterotrophic nutrition?
25. Identify the number of replaceable hydrogen ions (H^+) in the following acids:
 - i. HCl
 - ii. CH_3COOH
 - iii. H_2SO_4
 - iv. H_3PO_4
26.
 - i. Name the property of ethanol which makes it useful in medicines.
 - ii. Name the organic compound which is used in pickles. Mention its composition.
 - iii. Mention any two uses of alcohol in medicines.

Section C

27. State three reasons for the following facts:
 - i. Sulphur is a non-metal.
 - ii. Magnesium is a metal.

One of the reasons must be supported with a chemical equation.

28. A modern insecticide has been introduced with certain new properties like accumulation in the bodies of predators, broken down by soil bacteria, easily washed into lakes and rivers and taken up by plant roots. Among all these properties which one will help in reducing or keeping the level of environment pollution to lowest.
29. The refractive indices 1.0003, 1.31 1.5 respectively of Air, Ice and Benzine in which of these does the light travels fastest?

OR

- i. Name the spherical mirror used as:
 - a. shaving mirror
 - b. Rear view mirror in vehicles
 - c. Reflection in search-light.
 - ii. Write any three difference between a real and a virtual image.
30. The diagram given below is the experiment set-up of show that carbon dioxide is given out during respiration. In this set-up what does test tube marked (A) contain?

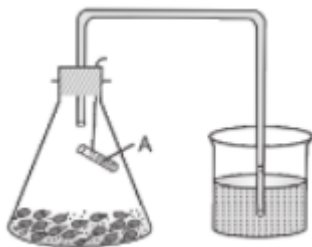
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What are its role in the experiment



31. How can changes of size of eyeball be one of the reason for

- myopic and
- hypermetropic eye?

Compare the size of eyeball with that of a normal eye in each case. How does this changes of size affect the position of image in each case?

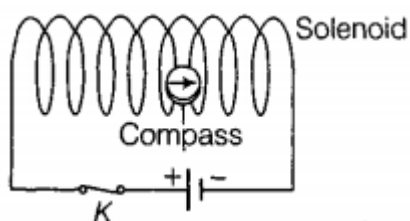
32. Answer the following:

- With the help of a diagram demonstrate the process of regeneration as seen in Planaria?
- Which type of cells are used by such multicellular organisms to regenerate?

OR

Mention three important features of fossils which help in the study of evolution.

33. A plotting compass is placed inside a solenoid and the compass needle is pointing in the direction as shown.



- Complete the diagram by drawing arrow heads to indicate the direction of the current flow.
- Describe the direction of the magnetic field inside the solenoid.

Section D

34. Solution A turns the universal indicator blue to purple whereas solution B turns the universal indicator orange to red.

- What will be the action of solution A on litmus?
- What will be the action of solution B on litmus?
- Name any two substances which can give solutions like A.
- Name any two substances which can give solutions like B.
- What sort of reaction takes place when solution A reacts with solution B?

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OR

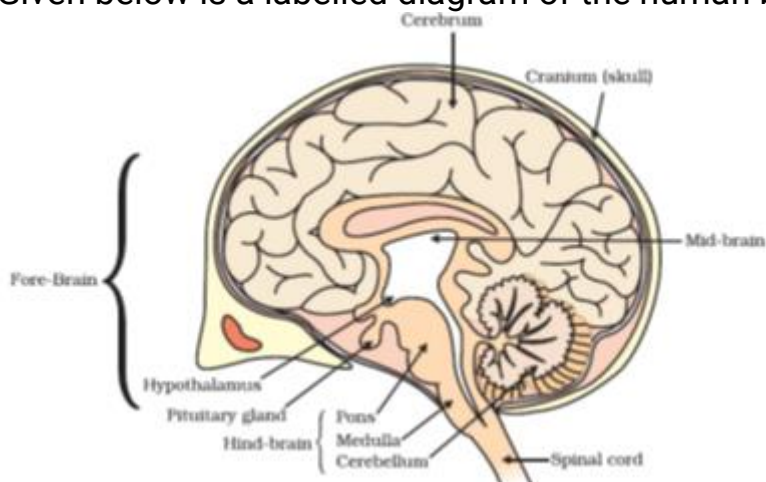
- i. Why does an aqueous solution of acid conduct electricity?
- ii. How does the concentration of hydrogen ions $[H_3O]^+$ changes when the solution of an acid is diluted with water?
- iii. Which has higher pH. A concentrated or dilute solution of HCL?
- iv. What would you observe on adding dil HCL acid to
 - a. Sodium bicarbonate placed in a test tube.
 - b. Zinc metal in a test tube.

35.

- i. What are animal hormones? List their two characteristics.
- ii. Name the hormone.
 - a. Which brings change in male humans during the beginning of adolescence.
 - b. Which coordinates the level of sugar in blood?

OR

Given below is a labelled diagram of the human brain.



Using the given diagram, answer the following questions:

- i. Which part of the brain controls reflex movements of the head, neck, and trunk?
 - ii. Name the part of the human brain which contains a vital centre for controlling blood pressure.
 - iii. Which part of the hindbrain regulates respiration?
 - iv. How is the brain protected from injuries and shock?
 - v. Which part of the human brain is the main thinking region?
36. Describe the activity that shows that a current-carrying conductor experiences a force perpendicular to its length and the external magnetic field. How does Fleming's left-hand rule help us to find the direction of the force acting on the current-carrying conductor?

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Section E

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

In fruitflies, the gene for wing shape has two alleles, an unusual allele for curled wings (c) and the normal allele for straight wings (C). The given phenotypes are observed for each genotype.

Genotype	Phenotype
CC	Normal, straight wings
Cc	Wings curled up at the ends, has difficulty flying
cc	Unable to hatch from egg

i. Which of the following crosses would produce live offspring from 50% of the eggs?

ii. Which of the following crosses would be able to produce offspring that would fly normally from 50% of the egg?

OR

Normal straight-winged flies are self-crossed and they produce 120 eggs. What is the proportion of curly-winged flies expected among the live offspring?

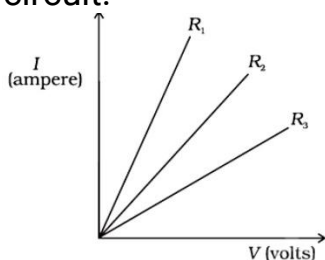
38. **Read the text carefully and answer the questions:**

In 1827, a German physicist Georg Simon Ohm (1787-1854) found out the relationship between the current I , flowing in metallic wire and the potential difference across its terminals. He stated that the electric current flowing through a metallic wire is directly proportional to the potential difference V , across its ends provided its temperature remains the same.

The resistance of a circuit is defined as the ratio between the voltage applied to the current flowing through it. Rearranging the above relation,

$$R = \frac{V}{I}$$

Electric charge flows easily through some materials than others. The electrical resistance measures how much the flow of this electric charge is restricted within the circuit.



- What is the unit of electrical resistance?
- Define Ohm's law.
- From graph which resistance have high resistance?

OR

What does the slope of V-I graph at any point represent?

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39. Read the text carefully and answer the questions:

When oxygen combines with other elements or compounds, the process is called oxidation the substances that combine with oxygen are said to have been oxidized. The reduction is exactly the opposite of oxidation. If a substance loses oxygen during a reaction, it is said to be reduced. When hydrogen burns the hydrogen combines with oxygen to form water $2\text{H}_2 + \text{O}_2 = \text{H}_2\text{O}$

The hydrogen is oxidized in this reaction, but at the same time, the oxygen is reduced. Whatever oxidation occurs reduction must also occur.

- Which chemical process is used for obtaining a metal from its oxide?
- In the given reaction, which reactant species is oxidized?
- In the given reaction, which reactant species is reduced?

OR

If four molecules of Hydrogen are combined with oxygen then how many molecules of water are formed?

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Sample Paper - 07 (2022-23)

Solution

Section A

1. (a) Rancidity

Explanation: Rancidity is defined as chemical decomposition of oils and fats which in other words is spoiling food materials that is difficult for consumption. It is used to denote unpleasant odours and flavours in foods resulting from deterioration in the fat or oil portion of food.

2. (b) (i) - (c), (ii) - (b), (iii) - (d), (iv) - (a)

Explanation:

- Iodine is a non-metal having a lustrous appearance. It has a shiny surface.
- Gallium is a metal that melts at room temperature. It can start melting in hand. The melting point of Gallium is 29.76°C .
- Sodium is a soft metal. It can be cut easily with a knife.
- Mercury is a liquid at room temperature. It is used in thermometers.

3. (c) Receptors → Sensory neuron → Spinal cord → Motor neuron → Muscle

Explanation: In a reflex arc, sensory neurons pick signals from receptors. These signals are then sent to the spinal cord from where they go to the muscle via motor neurons.

4. (d) cross fertilisation

Explanation: Two pink colored flowers on crossing resulted in 1 red, 2 pink, and 1 white flower progeny. The nature of the cross will be cross-fertilization. Cross-fertilization is

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the transfer of pollen grains from one plant to the stigma of the flower borne of a different plant of the same species.

5. (d) B

Explanation: The mirror and the screen should be firmly placed for an accurate measure of the separation.

6. (c) Yeast

Explanation: A small protuberance is formed on the parent cell that grows into full size and forms a bud

7. (b) less than unity

Explanation: Here the ray of light bends away from normal when it enters from medium A into medium B. This shows that medium B is optically rarer than medium A. Therefore, the speed of light in medium B is more than the speed of light in medium A. So, ratio of speed of light in medium A to speed of light in medium B will be less than one.

8. (a) N

Explanation: Nitrogen is a component of amino acids and urea. Amino acids are the building blocks of all proteins. So, N is essential for the formation of protein.

9. (b) chemotropism

Explanation: Chemotropism is the growth of organisms such as bacteria and plants, with the help of a chemical stimulus from outside of the organism or from the organism's part. An example of chemotropic movement can be seen during the growth of the pollen tube, where ovules release certain chemicals which stimulate the growth of pollen tubes towards ovules.

10. (c) anther and ovary

Explanation:

- The anther is part of the stamen (male sex organ) that produce pollen (male gamete).
- The ovary is an inferior part of the pistil (female sex organ) which contains ovule. Female gametophyte develops in the ovule.

11. (c) Statement B is true, A is false

Explanation:

- There are 8 pairs of cervical spinal nerves, 12 pairs of thoracic spine nerves, 5 pairs of lumbar spine nerve, 5 sacral nerve pairs, and 1 coccygeal nerve that does not come as a pair, this totals up to 31.
There are 12 pairs of cranial nerves.
- Ethylene inhibits cell division, DNA synthesis, and growth in the meristems of roots.

12. (b) Both A and B are metals

Explanation: A is Sodium (Atomic number 11) and B is Calcium (Atomic number 20). Both are metals.

13. (b) (iii) and (iv)

Explanation: Gonads have a dual function, production of hormones and gametes. In the male, testes produce sperms and testosterone.

The placenta develops in females during pregnancy. It has a number of functions, like

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the production of hormones, nutrition, excretion, etc. Estrogen is a female hormone produced by the ovaries (female gonads).

14. (b) Soaps are acidic in nature.

Explanation: Soaps are basic in nature. **Soaps** are sodium or potassium salts of long-chain fatty acids. When triglycerides in fat/oil react with aqueous NaOH or KOH, they are converted into **soap** and glycerol. This is called alkaline **hydrolysis** of esters.

E.g. $C_{17}H_{31}COONa$ (Sodium stearate) is a soap. Scum is produced when the soap reacts with calcium and/or magnesium ions present in hard water.

15. (c)

Explanation: This dot structure shows a complete octet after oxygen shared two electrons with two univalent atoms of hydrogen.

16. (a) Iron articles should be covered with plastic

Explanation: The most common method of preventing the rusting of iron is to coat its surface with paint or apply grease, oil or varnish. Rusting of iron can be prevented by galvanization. The process of depositing a thin layer of Zinc metal on Iron objects is called galvanization. Iron articles should be covered with plastic is the incorrect method of preventing rusting.

17. (c) A is true but R is false.

Explanation: Weak acids have low electrical conductivity because the number of ions furnished by weak acids is less as compared to strong acids in their aqueous solution.

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

Explanation: Both A and R are true but R is not the correct explanation of A.

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

Explanation: The main organ of human excretory system is kidney. The major function performed by kidneys is to remove excess water and nitrogenous wastes from blood in the form of urine.

20. (d) A is false but R is true.

Explanation: Bronze is an alloy of copper and tin.

Section B

21. Astigmatism is a common vision condition that happens when a person's cornea is not symmetrical. Because of its asymmetrical curvature, the astigmatic eye focuses light correctly along one axis, but incorrectly along the other. Light entering the eye is not focused on a single point on the retina, so objects both near and far become blurred or distorted producing an effect similar to looking through a pane of wavy glass. Hence, a person cannot focus on both horizontal as well as vertical lines at the same time. So he can see the objects clearly only in one plane.

This defect is mainly due to the cornea that is not perfectly spherical. As a result, the cornea has different curvatures in different directions of the horizontal and vertical planes.

This defect can be corrected by using cylindrical lenses of suitable focal length and suitable axis.

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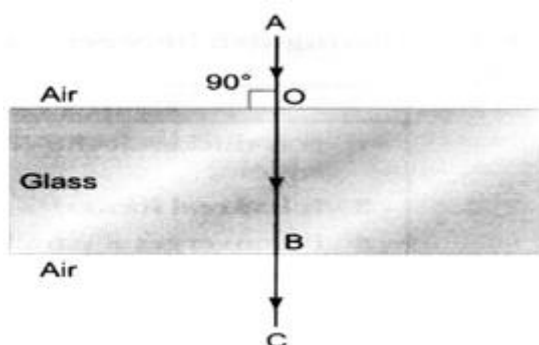
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The ciliary muscles are elastic muscles which hold the eye lens in its position. When the muscles contract and relax it changes the shape of the eye lens which in turn increases or decreases the focal length of the eye lens. This phenomenon is known as the power of accommodation and enables us to see the objects clearly placed at different positions.

22. ill effects of acid rain are:

- (1) Acid rain makes the soil acidic which affects the growth of trees and cereal crops badly.
- (2) It makes the water of lakes, ponds, etc. acidic which affects the growth of aquatic plants and animals.
- (3) Decomposer Bacteria useful for maintaining soil fertility are killed in acidic soil.
- (4) It damages the historical monuments and buildings badly especially those made up of marble.

23. When a ray of light falls normally on the surface of a medium, then, no bending of light ray occurs. It means the light ray goes straight from one medium to another.



24. Differences between Autotrophic and Heterotrophic nutrition:

Autotrophic Nutrition	Heterotrophic Nutrition
1) It occurs in green plants and green algae.	1) It occurs in animals and insectivorous plants.
2) CO ₂ and water are raw materials which combine to form organic compound.	2) They depend on plants and herbivores for their food.
3) They need chlorophyll and sunlight.	3) There is no need of such things.
4) Chlorophyll is required.	4) Chlorophyll is not required.
5) Food is generally in day time.	5) Food can be obtained at all time.

25.

- i. HCl - One replaceable H⁺ ion is present
- ii. CH₃COOH - One replaceable H⁺ ion is present
- iii. H₂SO₄ - Two replaceable H⁺ ions are present
- iv. H₃PO₄ - Three replaceable H⁺ ions are present

26.

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- i. Ethanol is good solvent, so it is used to make medicines. It is also used as antiseptic and sedative.
- ii. Vinegar is widely used as a preservative in pickles. It is 5-8% solution of ethanoic acid (acetic acid) in water.
- iii. Alcohol is used in tincture of iodine and cough syrups.

Section C

- 27.
- i. Sulphur is a non-metal because of the following reason:
 - a. It is a poor conductor of electricity.
 - b. Sulphur is neither malleable nor ductile.
 - c. Sulphur forms acidic oxide.
$$\text{S} + \text{O}_2 \rightarrow \text{SO}_2$$
$$\text{SO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4$$
 - ii. Magnesium is metal because of the following reason.
 - a. It is a good conductor of electricity.
 - b. Magnesium is malleable nor ductile.
 - c. It forms basic oxides
$$2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$$
28. Insecticides are non-biodegradable chemicals added to crop fields to kill and stop the growth of insects harmful to crops. Modern insecticides are being developed keeping in mind, the harm they cause to the environment and its components thus they create biodegradable insecticides which can be decomposed into harmless substances, which further degrade and does not accumulate in the environment and causing no pollution. Non-biodegradable insecticides does not degrade but build up in the the body of the organisms and pass on to organisms that feed on it and thus they keep on accumulating along the food chain in increasing amounts, resulting in significant amounts in the tissues of consumers at the highest trophic level this is also known as biological magnification.
The property of newly developed insecticides includes that it can easily get decomposed into simpler components by soil bacteria, i.e. biodegradable, which will help in the reduction of environmental pollution.
29. Refractive indices of Air, Ice and Benzene are 1.003, 1.31 and 1.5 respectively. Velocity of light in a medium is inversely proportional to refractive index of the medium. Light will travel fastest in air (having least refractive index i.e. 1.0003) and slowest in Benzene (having maximum refractive index i.e. 1.5)

OR

- i.
 - a) Shaving mirror- Concave mirror
 - b) Rear view mirror - Convex mirror
 - c) Reflection in search-lights - Concave mirror.

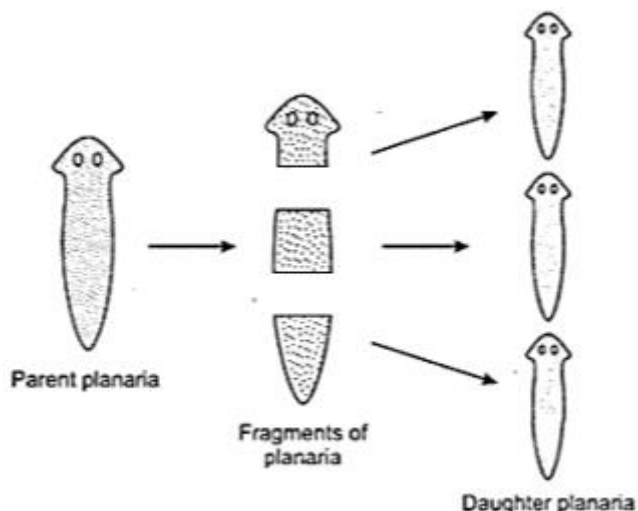
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- ii. The three differences are:
- Real image can be obtained on screen but a virtual image cannot be obtained.
 - Reflected/Refracted rays actually meet where the real image is formed while for virtual they only appear to meet.
 - A Real image is always inverted while the virtual image is always erect.
30. The test-tube (A) contains potassium hydroxide. It absorbs the CO_2 released during the respiration of seeds which creates a partial vacuum in conical flask causing the rise in the water level of the bent delivery tube. Rise in level of water shows that CO_2 is released during respiration.
- 31.
- The eye suffering from myopia or short-sightedness, has long eyeball than that of normal eye due to which the retina is at a larger distance from the eye lens thus image formation occurs before retina rather than onto it.
 - The eye suffering from hypermetropia or long-sightedness has short eyeball than that of normal eye due to which the retina is at smaller distance from the eye lens thus, the formation of the image occurs behind the retina and not on retina.
- 32.
- Regeneration is the process by which an organism has the ability to regenerate its lost parts of the body that might have been removed by injury or by some other methods. Planaria have the ability to give rise to new individuals from their body parts. When Planaria is cut into many pieces, each piece grows into a complete organism. Regeneration is carried out by specialized cells which have the capacity to develop, proliferate and differentiate into various cell types and tissues.



- A single pluripotent adult stem cell type (neoblasts) is used by such multicellular organisms to regenerate.

OR

- Fossils represent modes of preservation of ancient species.

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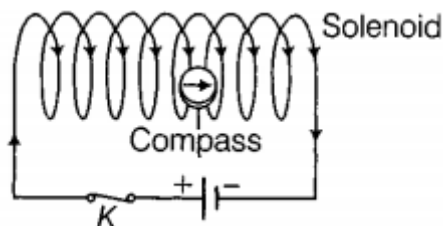
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- ii. Fossils help in establishing evolutionary traits among organisms and their ancestors that is their phylogeny.
- iii. The age of the fossil helps in determining the time period in which that species lived and how old are the fossils.

33.

i.



- ii. The direction of the magnetic field inside the solenoid always points from the induced South pole towards the induced North pole.

Section D

34.

- i. Solution A turns the universal indicator blue to purple so it is basic in nature and will turn red litmus to blue.
- ii. Solution B turns the universal indicator orange to red so it is acidic in nature and will turn blue litmus to red.
- iii. Milk of magnesia and sodium hydroxide solution are bases like solution A.
- iv. Lemon juice and hydrochloric acid are acids like solution B.
- v. Neutralisation reaction takes place between A and B, i.e. between an acidic and basic solution.

OR

- i. An aqueous solution of an acid conducts electricity because in water an acid (HCl) dissociates to give ions. Since the current is carried out by the movement of ions, an aqueous solution of acid conducts electricity.
- ii. During dilution, more of acid dissociates into ions. Thus concentration of $[H_3O]^+$ ions will increase on dilution.
- iii. Even on increasing $[H_3O]^+$ ions, the number of ions per unit volume decreases. Therefore pH will increase on dilution.
- iv. (a) CO_2 gas will evolve accompanied by brisk effervescence.
 $NaHCO_3(s) + HCl(aq) \rightarrow NaCl(aq) + CO_2(g) + H_2O(l)$
(b) H_2 gas will evolve accompanied by brisk effervescence.
 $Zn(s) + 2HCl(aq) \rightarrow ZnCl_2(aq) + H_2(g)$

35.

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- i. Hormones are the chemical substances that regulate the biological processes in the living organisms.

Characteristics of Hormones

- a. They are poured directly into the bloodstream in very small amounts and are carried throughout the body by circulatory system.
 - b. They act only on the specific target organs.
- ii.
 - a. Testosterone(produced by testes) is the hormone which brings the change in the male during adolescence.
 - b. Insulin (decrease blood sugar) and glucagon (increase blood sugar), secreted by pancreas coordinates the sugar level in blood.

OR

- i. The midbrain controls the reflex movements of the head, neck, and trunk in response to visual and auditory stimuli.
 - ii. The medulla contains a vital centre for controlling blood pressure, respiration, swallowing, salivation, vomiting, sneezing, and coughing.
 - iii. Pons regulates respiration.
 - iv. The brain is protected by a bony box called cranium, within that three layers of fluid-filled membranes called meninges are present for absorbing shock.
 - v. The forebrain is the largest part of the brain and is the main thinking region.
36. The activity to demonstrate that a current-carrying conductor experiences a force perpendicular to its length and the external magnetic field can be explained as follows:
Activity: To show the effect of magnetic field on a current-carrying conductor
Materials Required: For this, we need to take a small aluminum rod, a horseshoe magnet, battery, plug key, wires, and a stand.
- i. Suspend an aluminum rod horizontally from the stand and two wires at the ends of it are tied. The wires are connected to a Rheostat, battery and a key so that a circuit is completed,
 - ii. Place a horseshoe magnet in such a manner that the aluminum rod is between the poles of a magnet.

Assume that the above the aluminum rod is South pole of the magnet and below, the north pole of the magnet. Insert the plug key and current is supplied to the rod.

Observation: the aluminum rod is deflected towards the left direction

On changing the direction of the current, the rod is deflection in the right direction.

Hence, it demonstrates that a current-carrying conductor experiences a force perpendicular to its length and the external magnetic field

The direction of the magnetic field can find out with the help of Fleming's left-hand rule. Let current is moving in an anticlockwise direction, then the direction of the magnetic field will be in clockwise direction i.e. at the top of the loop whereas vice-versa in case

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of the clockwise direction of the current.

Section E

- 37.
- $Cc \times cc$
Genotype refers to the genetic constitution of living organisms. A genotype is the total sum of genes transferred from parents to offspring.
 - $CC \times Cc$

OR

Normal straight-winged flies are self-crossed and they produce 120 eggs. 0% of curly-winged flies are expected among the live offspring.

- 38.
- Ohm is the unit of electrical resistance.
 - According to Ohm's law, there is a relation between the current flowing through a conductor and the potential difference across it. It is given by,
 $V \propto I$ $V = IR$
 - R_3 resistance has high resistance.

OR

The slope of V-I graph at any point represents resistance.

- 39.
- The process is known as the reduction of metal oxide.
 - In the given reaction, H_2 is oxidized.
 - In the given reaction, O_2 is reduced.

OR

If four molecules of Hydrogen are combined with oxygen then four molecules of water are formed.