



	<p>(c) bleaching powder                      (d) tartaric acid</p> <p>Ans.:</p> <p>Correct response : a (washing soda <math>\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}</math>)</p> <p>Option b: Baking soda is <math>\text{Na}_2\text{HCO}_3</math> (sodium hydrogen carbonate or sodium bicarbonate);</p> <p>Option c: Bleaching powder is <math>\text{CaOCl}_2</math>, (calcium oxychloride or chloride of lime)</p> <p>Option d: Tartaric acid is <math>\text{C}_4\text{H}_6\text{O}_6</math></p> <p><b>Suggestive measures:</b></p> <p>The student needs to correlate the common name with chemical formulas of given compounds.</p>	1
4	<p>Which of the following is the correct arrangement of the given metals in descending order of their reactivity?</p> <p>Zinc, Iron, Magnesium, Sodium</p> <p>(a) Zinc Iron &gt; Magnesium &gt; Sodium</p> <p>(b) Sodium Magnesium &gt; Iron &gt; Zinc</p> <p>(c) Sodium &gt; Zinc &gt; Magnesium &gt; Iron</p> <p>(d) Sodium Magnesium &gt; Zine &gt; Iron</p> <p>Ans.:</p> <p>Correct response : d (<math>\text{Na} &gt; \text{Mg} &gt; \text{Zn} &gt; \text{Fe}</math>)</p> <p>Option a: wrong sequence, sodium is more reactive than magnesium.</p> <p>Option b: wrong sequence, zinc is more reactive than iron.</p> <p>Option c: wrong sequence, magnesium is more reactive than zinc.</p> <p><b>Suggestive measures:</b></p> <p>The student needs to understand the reactivity series thoroughly. In reactivity series, the metals are arranged in the decreasing order of their reactivity. The most reactive are placed on the top and the least reactive at the bottom.</p>	1
5	<p>Example of an amphoteric oxide is:</p> <p>(a) <math>\text{Na}_2\text{O}</math>                                      (b) KO</p> <p>(c) <math>\text{Al}_2\text{O}_3</math>                                      (d) MgO</p>	

K	Potassium	Most reactive ↑ Increasingly reactive ↓ Least reactive
Na	Sodium	
Ca	Calcium	
Mg	Magnesium	
Al	Aluminium	
Zn	Zinc	
Fe	Ferum	
Sn	Tin	
Pb	Lead	
Cu	Copper	
Hg	Mercury	
Ag	Silver	
Au	Gold	

	<p>Ans.:          Correct response : c (aluminium and zinc reacts with base as well as acid)          Option a: <math>\text{Na}_2\text{O}</math> is a metal oxide which is basic in nature.          Option b: <math>\text{K}_2\text{O}</math> is a metal oxide which is basic in nature.          Option d: <math>\text{MgO}</math> is a metal oxide which is basic in nature.</p> <p><b>Suggestive measures:</b>          The student needs to go through the reactions of metal oxides with acids and bases.          Metal oxide are generally basic in nature and they reacts with acids to form salts whereas oxide of aluminium and zinc reacts with base as well as acid, thus are amphoteric oxide.</p>	1
6	<p>Which of the following pairs will give displacement reactions?</p> <p>(a) <math>\text{FeSO}_4</math> solution and Copper metal          (b) <math>\text{AgNO}_3</math> solution and Copper metal          (c) <math>\text{CuSO}_4</math> solution and Silver metal          (d) <math>\text{NaCl}</math> solution and Copper metal</p> <p>Ans.:          Correct response : b (In reaction between <math>\text{AgNO}_3</math> solution and copper metal, Cu is more reactive than Ag therefore Cu displaces Ag from its salt solution)</p> <p>Option a: In reaction between <math>\text{FeSO}_4</math> solution and copper metal, Fe is more reactive than copper therefore no reaction will takes place.</p> <p>Option c: In reaction between <math>\text{CuSO}_4</math> and silver metal, Cu is more reactive than silver therefore no reaction will takes place.</p> <p>Option d: In reaction between <math>\text{NaCl}</math> and copper metal, Na is more reactive than copper therefore no reaction will takes place.</p> <p><b>Suggestive measures:</b>          The student needs to go through the reactivity series and displacement reactions.          Based on reactivity series salt solution of less reactive metal will be displaced by more reactive metal.</p>	1



	<p>Option c: pseudopodia in amoeba help in capturing food particles and its motion from one place to another. Option d: chloroplast is part of plant cell only.</p> <p><b>Suggestive measures:</b> The student needs to understand nutrition in amoeba in detail. Nutrition in amoeba is holozoic. The solid food particles are ingested with the help of pseudopodia and enclosed into a food vacuole. Enzymes in it act on the enclosed food particles and digest it.</p>	
9	<p>What are the products obtained by anaerobic respiration in yeast?</p> <p>(a) Lactic acid + Energy (b) Carbon dioxide + Water + Energy (c) Ethanol + Carbon dioxide + Energy (d) Pyruvate</p> <p>Ans.: Correct response : c (during anaerobic respiration in yeast the glucose is breaks down into ethanol, CO<sub>2</sub>, and energy)</p> <p>Option a: In muscle cells when supply of oxygen is insufficient the glucose is beaks down Lactic acid and energy.</p> <p>Option b: During aerobic respiration carbon dioxide, water and energy are produced.</p> <p>Option d: pyruvate is the initial product formed when glucose is breakdown in the cytoplasm in the respiration process.</p> <p><b>Suggestive measures:</b> The student needs to go through the break down of glucose by various pathways during respiration process. In yeast, the end products of anaerobic respiration are ethyl alcohol, carbon dioxide and ATP (Adenosine triphosphate).</p>	1
10	<p>A cell divided into several cells during reproduction in Plasmodium is called:</p> <p>(a) budding (c) binary fission</p> <p>(b) multiple fission (d) reduction division</p>	



	<p>The student needs to understand how genes expressed himself and responsible for the inheritance of the traits.</p> <p>Swimming, Sculpted body Archery are acquired traits. such traits do not change genetic makeup of the individual thus are not inherited to the offspring.</p>	
12	<p>Which of the following events in the mouth cavity will be affected if salivary amylase is lacking in the saliva?</p> <p>(a) Starch breaking down into sugars.</p> <p>(b) Proteins breaking down into amino acids.</p> <p>(c) Absorption of vitamins.</p> <p>(d) Fats breaking down into fatty acids and glycerol.</p> <p>Ans.:</p> <p>Correct response : a (saliva have salivary amylase enzyme that breakdown carbohydrates into sugars)</p> <p>Option b: Breakdown or digestion of protein only starts in Stomach.</p> <p>Option c: Absorption of digested nutrients only takes place in the small intestine.</p> <p>Option d: Lipase is an enzyme that degrades lipids found in emulsified fat and transforms them into fatty acids and glycerol.</p> <p><b>Suggestive measures:</b></p> <p>The student needs to understand the role of different enzyme in the digestion process.</p> <p>Amylase is an enzyme that breaks down starch into simple sugars. Digestion of starch begins in mouth. As a result, if salivary amylase is deficient, starch digestion is affected.</p>	1
13	<p>Correct response : b ( concave mirror converge the reflected rays which intersect each other and forms the real image)</p> <p>Option a: Parallel rays never intersect each other thus no real image will be formed.</p> <p>Option c: convex mirror will diverge reflected rays which seems to be intersect virtually and forms virtual image.</p>	

**Suggestive measures:**

The student needs to practice and understand the concept of image formation by mirror and lens.

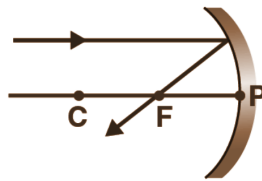
All the light rays which are parallel to the principal axis of a concave mirror, converge at the principal focus (F) after reflection and appear to intersect each other to form a real image.

- The Rays parallel to the principal axis after reflection will pass through the principal focus in case of concave mirror or appear to diverge from the principal focus in case of a convex mirror.
- A ray passing through the principal focus of a concave mirror or a ray which is directed towards the principal focus of a convex mirror after reflection will emerge parallel to the principal axis.
- A ray passing through the centre of curvature of a concave mirror or directed in the direction of the centre of curvature of a convex mirror, after reflection is reflected back along the same path.

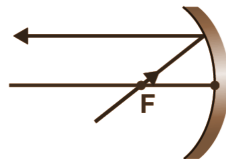
**A ray incident obliquely to the principal axis, towards a point P on the concave mirror or a convex mirror is reflected obliquely.**

For a concave mirror, any of the following four ray diagrams can be used for locating the image formed:

a) A ray parallel to the principal axis, after reflection, will pass through the principal focus of a concave mirror.

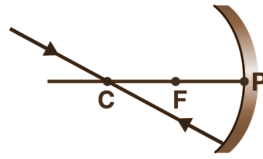


b) A ray which is passing through the principal focus of a concave mirror, after reflection, will emerge parallel to the principal axis.

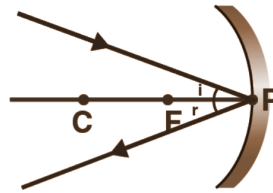


c) A ray passing through the centre of curvature of a concave mirror, after reflection, is reflected along the same path. The light rays come back along the same path because the incident rays fall on the mirror along the normal to the reflecting surface.





d) A ray incident obliquely to the principal axis, towards the point P (pole of the mirror), on the concave mirror, is reflected obliquely. The incident and reflected rays follow the laws of reflection at point P, making equal angles with the principal axis.



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14

Correct response : b (Wavelength of red light is longest thus get least scattered by particle in the atmosphere)  
 Option a: Wavelength of violet light is short in the spectrum of light thus it scattered the most by smoke or fog.  
 Option c: light is not absorbed by smoke or fog

**Suggestive measures:**

The student needs to understand the phenomena of scattering of light. The light of a shorter wavelength is scattered much more than the light of a longer wavelength. The wavelength of red light is longest in white light so it will scatter the least. violet is most scattered by fog or smoke particles.

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15

The cleaners of nature (ecosystem) are:  
 (a) Producers (b) Consumers  
 (c) Herbivores (d) Decomposers

Ans.:  
 Correct response : d (decomposers are the cleaners of the nature)  
 Option a: plants are the producer in the ecosystem.  
 Option b: animals are the consumers in the ecosystem.

1



	<p>During a chemical change a new product with different chemical and physical composition is formed.</p> <p>Incorrect responses:  Option 'b': This option is incorrect as During a chemical change a new product with different chemical and physical composition is formed which correctly explain the assertion.  Option 'c': This option is incorrect as both the statments are true and none of them are false.  Option 'd': This option is incorrect as both the statments are true.</p> <p><b>Suggestive measures:</b>  The student needs to understand the types of different changes taking place in the surrounding and the type of chemical reactions.</p>	
18	<p>The correct answer is option 'c' where assertion (A) is true but reason(R) is not true as there are some fish which reproduce by internal fertilization and some fish reproduce by externally.</p> <p>Incorrect responses:  Option a-This option is incorrect which states that 'Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)', because reason(R) is not true as some fishes reproduce by external fertilization.  Option 'b':This option is incorrect as assertion (A) is true but Reason(R) is not true.  Option d-Which states that 'Assertion (A) is false but Reason ( R) is true'- is also incorrect as Assertion (A) is correct statement, so it can not be false.</p> <p><b>Suggestive measures:</b>  The Student needs to understand different type of fertilization. Internal fertilization is the process of fertilization that occurs inside the body of an individual. In fish, fertilisation of eggs can be either external or internal. In many species of fish, fins have been modified to allow internal fertilisation.</p>	1
19	<p>The correct answer is option 'c' where Assertion (A) is true but Reason(R) is false.because The direction of magnetic field around a conductor can be given in accordance with Right hand thumb rule not by left hand thumb rule.</p> <p>Option 'a':This option is incorrect which states that 'Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)', because The direction of magnetic field around a conductor can be given in</p>	

	<p>accordance with Right hand thumb rule not by left hand thumb rule.</p> <p>Option 'b': This option is incorrect as from assertion (A) and Reason (R) assertion is true but reason (R) is false due to left hand thumb rule instead of right hand thumb rule.</p> <p>Option 'd': This option is incorrect as assertion is true but reason is false due to left hand thumb rule instead of right hand thumb rule.</p> <p><b>Suggestive measures:</b> The student needs to observe the right hand rule to find out the direction of the magnetic field around a current carrying conductor. Direction of the magnetic field around a conductor can be given in accordance with the <i>right hand thumb rule</i>.</p>	1
20	<p>The correct answer is option 'b'- Both 'A' and 'R' are true but 'R' is <u>not</u> the correct explanation of the assertion. The correct explanation of this assertion as UV rays has the energy required to fuse three molecule of the oxygen.</p> <p>Option a : This option is incorrect which states that 'Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A)'. Reason (R) is true but not correct explanation of the assertion.</p> <p>Option c: This option is incorrect as both the statement are true. Option d: This option is incorrect as both the statement are true.</p> <p><b>Suggestive measures</b> The student needs to practice assertion and reason questions.</p>	1
<b>Section-B</b>		
	Correct Response	
21	<p>A solution of potassium chloride, when mixed with silver nitrate solution, an insoluble white substance is formed. Write the chemical reaction involved and also mention the type of the chemical reaction?</p> <p>Ans.:</p> <ul style="list-style-type: none"> <li>• When an aqueous solution of potassium chloride (KCl) mixed with silver nitrate (AgNO<sub>3</sub>) solution an insoluble white substance of silver chloride (AgCl) is formed.</li> </ul> <p>The chemical reaction is as follows :</p>	1



	<p>i. <u>all the cells are not in direct contact with the environment</u> and</p> <p>ii. <u>diffusion is a slow process.</u></p> <p>(Diffusion is too slow to cover the distance between the gas exchange surface and the sites where the oxygen is required. That is why we need a gas transport system - the bloodstream. Due to higher metabolic rate and the volume of human body is so large that oxygen cannot diffuse into all cells of the body quickly as oxygen will have to travel large distances to reach each and every cell)</p> <p><b>Suggestive measures</b> The student needs to understand the concepts of respiration in complex organisms.</p>	1
24	<p>a) With the help of labelled ray diagram show the path followed by a narrow beam of light when it passes through a glass prism.</p> <p>b) Write your observations when white light passes (refracted) through a glass prism.</p> <p>Ans.:</p> <p>a.</p> <div data-bbox="289 1100 1349 1507"> <div data-bbox="1019 1163 1341 1444" style="border: 1px solid black; padding: 5px;"> <p>PE - Incident ray EF - Refracted ray FS - Emergent ray A - Angle of the prism <math>\angle i</math> - Angle of incidence <math>\angle r</math> - Angle of refraction <math>\angle e</math> - Angle of emergence <math>\angle D</math> - Angle of deviation</p> </div> </div> <p>b.</p> <p><b>Observation</b> At surface AB, the light ray enters obliquely and bends towards the normal on refraction. A spectrum will be observed on the screen placed near it (due to dispersion of light) consisting of seven colours.</p> <p><b>Suggestive measures</b></p>	1

	<p>The student needs to practice the ray diagram of the dispersion of light, rainbow formation and image formation by different mirror and lens.</p>	
25	<p>Name a device that you can use to maintain a potential difference between the ends of a conductor. Explain the process by which this device does so.</p> <p style="text-align: center;">OR</p> <p>Water has absolute refractive index 1.33 and alcohol has refractive index 1.36. Which of the two medium is optically denser? Give reason for your answer.</p> <p>Ans.</p> <ul style="list-style-type: none"> <li>● The device that helps to maintain the potential difference across a conductor is <u>a battery or a cell</u>.</li> <li>● The chemical reaction within a cell generates the potential difference across the terminals of the cell, even when no current is drawn from it. When it is connected to a conductor, it produces electric current and, maintain the potential difference across the ends of the conductor.</li> </ul> <p><b>Suggestive measures:</b> The student needs to understand the concept of potential difference and role of battery and other devices like ammeter, voltmeter etc. in the electric circuit.</p> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>● Refractive index of alcohol &gt; refractive index of water. So alcohol is optically denser than water.</li> <li>● Alcohol is optically denser medium as its refractive index is higher than that of water. When we compare the two media, the one with larger refractive index is called the optically denser medium than the other as the speed of light is lower in this medium.</li> </ul> <p><b>Suggestive measures:</b> The student needs to understand the concept of refractive index, absolute refractive index and optical mediums.</p>	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p>

26	<p>In the following food chain. 100 J of energy is available to the lion. How much energy was available to the producers? Explain.</p> <p>Plants ----&gt; Deer-----&gt; Lion</p> <p>Ans.:</p> <ul style="list-style-type: none"> <li>• In the given food chain: If 100 J of energy is available to lion, the plants or producers have 10,000 J of energy available to them.</li> <li>• As per 10% law of flow of energy in an ecosystem only 10% of energy is received by the next trophic level and 90% of energy is always used up by the organism itself for daily works i.e, body heat, reproduction, etc.</li> </ul> <p><b>Suggestive measures:</b> The student needs to understand the concept of transfer of energy in different trophic levels in an ecosystem.</p> <p>10% of x = 100 x = 1000 J in deer 10% of y = 1000 y = 10,000 J in Plant (producer)</p>	1 1
<b>Section C</b>		
27	<p>A white colour powder compound 'X' is used for making toys. It gets hardened to solid mass of compound 'Y' when mixed with water. When 'Y' is heated at 373K it changes to compound 'X' again.</p> <p>(i) Identify and write the chemical name and formula of 'X' and 'Y'</p> <p>(ii) Give the chemical equation for the above chemical reaction to form compound Y</p> <p>Ans.:</p> <p>(i) X → Plaster of Paris → <math>\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}</math></p> <p>Y → Gypsum → <math>\text{CaSO}_4 \cdot 2\text{H}_2\text{O}</math></p> <p>(ii) <math>\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O} + 1\frac{1}{2} \text{H}_2\text{O} \rightarrow \text{CaSO}_4 \cdot 2\text{H}_2\text{O}</math> (POP) (Gypsum)</p> <p><b>Suggestive measures:</b> The student needs to relate the chemical reaction involved in the formation of common salt and the uses of salt mentioned in the chapter.</p>	1 1 1



28	<p>Give reason for the following:</p> <p>(i) Hydrogen gas is not evolved when most of the metals react with nitric acid.</p> <p>(ii) Zinc oxide is considered as an amphoteric oxide.</p> <p>(iii) A piece of calcium start floating in water when it is drop in water.</p> <p style="text-align: center;">OR</p> <p>A metal X combines with a non-metal 'Y' by the transfer of electrons to form a compound 'Z'.</p> <p>(i) State the type of bond in compound Z..</p> <p>(ii) What will be the physical nature of compound Z?</p> <p>(iii) Will this compound dissolve in kerosene or petrol?</p> <p>Ans.:</p> <p>(i) Hydrogen gas is not evolved when most metals react with nitric acid. It is because <math>\text{HNO}_3</math> is a strong oxidising agent. It oxidises the <math>\text{H}_2</math> produced to water and itself gets reduced to any of the nitrogen oxides.</p> <p>(ii) <math>\text{ZnO}</math> reacts both with acids as well as bases to form salt and water. Thus, <math>\text{ZnO}</math> is an amphoteric oxide. /  <math>\text{ZnO} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2\text{O}</math> ; <math>\text{ZnO} + 2\text{NaOH} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2\text{O}</math></p> <p>(iii) Calcium reacts with water and release hydrogen gas. The bubbles of <math>\text{H}_2</math> gas sticks to the surfaces and decreases its density to float.</p> <p><b>Suggestive measures:</b>  The student needs to understand the chemical properties of metals.</p> <p style="text-align: center;">OR</p> <p>(i) The chemical bond formed by the transfer of electrons from one atom to another is known as an ionic bond.</p> <p>(ii) Compound Z is a ionic compound which are solid but brittle.</p>	<p style="text-align: right;">1</p> <p style="text-align: right;">1</p> <p style="text-align: right;">1</p> <p style="text-align: right;">1</p> <p style="text-align: right;">1</p>

	<p>(iii) Ionic compounds are insoluble in solvents such as kerosene or petrol they are soluble in water.</p> <p><b>Suggestive measures:</b> The student needs to differentiate between ionic compound and covalent compound and their physical properties.</p>	1
29	<p>(a) Name the endocrine gland which secretes growth hormone.</p> <p>(b) What will be the effect of the following on a person:</p> <p>(i) deficiency of growth hormone?</p> <p>(ii) excess secretion of growth hormone?</p> <p>Ans.:</p> <p>(a) Growth hormone (GH) is secreted by pituitary gland.</p> <p>(b) Effect of the following on a person:</p> <p>(i) Deficiency of growth hormone (hypoactivity) causes dwarfness.</p> <p>(ii) Excess secretion of growth hormone (hyperactivity) causes excessive growth of bones making the person very tall (gigantism).</p> <p><b>Suggestive measures:</b> The student needs to correlate different types of hormone and their specific role in the organism.</p>	<p>1</p> <p>1</p> <p>1</p>
30	<p>Mendel carry out an experiment to study inheritance of two traits in garden pea:</p> <p>(a) What were his findings with respect to inheritance of traits in F1 and F2 generation?</p> <p>(b) State the ratio of different traits obtained in the F2 generation in the above mentioned experiment.</p> <p>Ans.:</p> <p>(a) In F1 generation, all plants are with round shaped yellow seeds. But in F2 generation he observed new combination of different trait. He observed all types of plants: Round yellow, Round green, Wrinkled yellow, Wrinkled green. (any other)</p> <p>(b) F2 generation ratio: Round-yellow = 9: Round-green = 3: Colour of stem in F1 progeny Wrinkled- yellow = 3: Wrinkled-green = 1 (9:3:3:1)</p> <p><b>Suggestive measures:</b></p>	<p>1</p> <p>1</p> <p>1</p>

	The student needs to understand the ratios of different traits obtained in monohybrid and dihybrid cross.	
31	<p>(a) What is refraction of light?</p> <p>(b) If the refractive index of water is <math>4/3</math> and that of glass is <math>3/2</math>. What will be the refractive index of glass w.r.t. water?</p> <p>Ans.:</p> <p>(a) A phenomena, where light travelling obliquely from one medium to another the direction of propagation of light in second medium changes.</p> <p>(b) <math>\mu_w = 4/3</math>, and <math>\mu_g = 3/2</math>  Refractive index of glass w.r.t. water (<math>w\mu_g</math>)  <math>= \mu_g / \mu_w</math>  <math>= 3/2 / 4/3</math>  <math>= 3/2 \times 3/4 w\mu_g</math>  <math>= 9/8</math></p> <p><b>Suggestive measures:</b>  The student needs to practice more numerical related problems.</p>	<p>1</p> <p><math>1/2</math></p> <p><math>1/2</math></p> <p><math>1/2</math></p> <p>1/2</p>
32	<p>Two identical resistors are first connected in series and then in parallel. Find the ratio of equivalent resistance in two cases.</p> <p>Ans.:</p> <p>Let resistance of each resistor be R.</p> <p><math>R_s = R_1 + R_2</math></p> <p>So, <math>R_s = R + R = 2R</math></p> <p>For parallel combination,</p> <p><math>\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}</math> OR <math>R_p = \frac{R_1 R_2}{R_1 + R_2}</math></p> <p>So, <math>R_p = \frac{R \times R}{R + R} = \frac{R}{2}</math></p> <p>Required ratio = <math>\frac{R_s}{R_p} = \frac{2R}{R/2} = 4:1</math></p> <p><b>Suggestive measures:</b>  The student needs to calculate and differentiate between the equivalent resistance of series and parallel combinations in an electric circuit.</p>	<p><math>1/2</math></p> <p><math>1/2</math></p> <p>1</p> <p>1</p>

33	<p>(a) Column A contains some part of electrical devices and Column B contains the material used for making these devices. Match Columns A and B.</p> <table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Column A</th> <th style="text-align: left;">Column B</th> </tr> </thead> <tbody> <tr> <td>1. Filament of electrical bulb</td> <td>(a) Copper</td> </tr> <tr> <td>2. Heating elements</td> <td>(b) Lead-tin alloy</td> </tr> <tr> <td>3. Connection wire</td> <td>(c) Tungsten</td> </tr> <tr> <td>4. Welding wires</td> <td>(d) Nichrome</td> </tr> </tbody> </table> <p>(b) How much current will an electric bulb of 600 <math>\Omega</math> draw from a 110V source?</p> <p>Ans.:</p> <p>(a) 1-C, 2-D, 3-a, 4-B</p> <p>(b) <math>R = 600; V = 110V</math>  <math>V=IR</math>  <math>I = V/R = 110/600 = 0.18A</math></p> <p><b>Suggestive measures:</b>  The student needs to understand the Ohm's law and its application. And practice numerical problems.</p>	Column A	Column B	1. Filament of electrical bulb	(a) Copper	2. Heating elements	(b) Lead-tin alloy	3. Connection wire	(c) Tungsten	4. Welding wires	(d) Nichrome	$\frac{1}{2} * 4$  $\frac{1}{2}$ $\frac{1}{2}$
Column A	Column B											
1. Filament of electrical bulb	(a) Copper											
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3. Connection wire	(c) Tungsten											
4. Welding wires	(d) Nichrome											
<b>SECTION D</b>												
34	<p>(a) 3mL of ethanol is taken in a test tube and warmed gently in a water bath. A 5% solution of alkaline potassium permanganate (<math>KMnO_4</math>) is added first drop by drop to this solution, then in excess.</p> <p>(i) Name the product formed in this reaction.</p> <p>(ii) Write chemical equation of this reaction.</p> <p>(iii) State the role of alkaline potassium permanganate in this reaction.</p> <p>(b) Why pure Ethanoic acid is known as "glacial acetic acid"?</p> <p style="text-align: center;">Or</p>											

	<p>A compound 'X' on heating with excess conc. sulphuric acid at 443 K gives an unsaturated compound 'Y'. 'X' also reacts with sodium metal to evolve a colourless flammable gas 'Z'</p> <p>(i) Identify 'X', 'Y' and 'Z'.</p> <p>(ii) Write the equation of the chemical reaction of formation of 'Y' and also.</p> <p>(iii) Write the role of sulphuric acid in this reaction.</p> <p>Ans.:</p> <p>(a) (i) Carboxylic acid./Ethanoic acid.</p> <p>(ii)</p> $\underset{\text{Ethanol}}{\text{CH}_3\text{CH}_2\text{OH}} \xrightarrow[\text{Heat}]{\text{Alkaline KMnO}_4} \underset{\text{Ethanoic acid}}{\text{CH}_3\text{COOH}}$ <p>(iii) Here alkaline KMnO<sub>4</sub> acts as an oxidising agent. It oxidizes ethanol to ethanoic acid by donating nascent oxygen.</p> <p>(b) The melting point of pure ethanoic acid is 290K and hence it often freezes during winter in cold climates.</p> <p style="text-align: center;">OR</p> <p>(i) X = Ethanol;      Y = Ethene;      Z = Hydrogen</p> <p>(ii)</p> $\text{CH}_3\text{CH}_2\text{OH} \xrightarrow[443\text{K}]{\text{conc. H}_2\text{SO}_4} \text{CH}_2 = \text{CH}_2 + \text{H}_2\text{O}$ <p>(iii) Here, conc. H<sub>2</sub>SO<sub>4</sub> acts as a dehydrating agent i.e. helps in the removal of water.</p> <p><b>Suggestive measures:</b> The student needs to understand the physical and chemical properties of carbon compounds along with their uses.</p>	<p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>1+1+</p> <p>1</p> <p>1</p>
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What happens when:

- (a) accidentally, Planaria gets cut into many pieces
- (b) Bryophyllum leaf falls on the wet soil
- (c) on maturation sporangia of Rhizopus bursts?
- (d) a mature Spirogyra filament attains considerable length?
- (e) Female gamete/egg is not fertilised.

OR

- (a) What is vegetative propagation? Give one example.
- (b) Write three advantages of vegetative propagation.

Ans.:

(a) When Planaria accidentally gets cut into many pieces then its each piece grows into a complete organism. This is known as regeneration.

(b) When the Bryophyllum leaf falls on the wet soil, the buds present in the notches along the leaf margin develop into new plants. This is known as vegetative propagation.

(c) The sporangia of Rhizopus contain cells or spores that can eventually develop into new Rhizopus individuals when it bursts on maturation.

(d) It simply breaks into two or more fragments and each fragment then grows into a new Spirogyra.

(e) When the female gamete/egg is not fertilised, uterus lining is not needed any longer. So, the lining slowly breaks and comes out through vagina as blood and mucus.

**Suggestive measures:**

The student needs to understand and differentiate between different modes of asexual reproduction.

OR

(a) Develop new plant from vegetative part such as root, stem and leaves of the plant under appropriate condition. Eg. cutting / grafting/layering.(any other)

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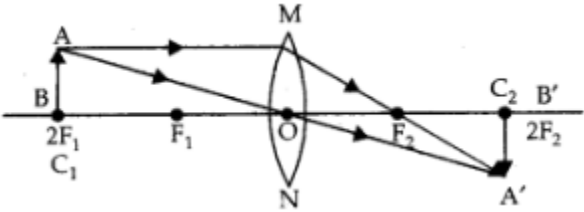
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	<p>(b) (i) Such plant can bear flowers and fruits earlier than those produced from seeds.</p> <p>(ii) Plants that lost the capacity to produce seed can also grow.</p> <p>(iii) All plant produced are genetically similar so no effect on the yield.</p> <p>(iv) No expertises is required to grow such plant.</p> <p style="text-align: right;">(any three)</p> <p><b>Suggestive measures:</b> The student needs understand the importance, conditions and meaning of vegetative propagation.</p>	<p>1</p> <p>1</p> <p>1</p>
36	<p>(a) A 2.0 cm Tall object is placed perpendicular to the principal axis of a canvex lens of focal length 10 cm. The distance of the object from the lens is 20 cm. Find the nature and position of the image.</p> <p>(b) Draw a neat labelled ray diagram for the above situation to support your answer.</p> <p style="text-align: center;">OR</p> <p>A spherical mirror produces an image of magnification-1 on a screen placed at a distance of 40 cm from the mirror.)</p> <p>(i) What type of mirror is it?</p> <p>(ii) What is the nature and size of the image formed?</p> <p>(iii) How far is the object located from the mirror?</p> <p>Ans.:a)</p> <p><math>v = ?; f = + 10 \text{ cm}; u = 20 \text{ cm}; h = +2 \text{ cm}</math></p> $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}; \frac{1}{v} = \frac{1}{u} + \frac{1}{f}$ $\frac{1}{v} = \frac{1}{-20} + \frac{1}{10} = \frac{-1}{20} + \frac{1}{10} = \frac{1+2}{20} = \frac{1}{20}$ <p><math>v = + 20 \text{ cm}</math></p>	<p style="background-color: #e0f0e0;">1/2</p> <p>1/2</p> <p>1</p>

	<p>Nature : Real; position – at 20 cm on other side of optical centre.</p> <p>(b)</p>  <p style="text-align: center;">OR</p> <p>(i) This is a concave mirror.  (ii) The image is real and inverted and of same size.</p> <p>(iii) As <math>m = -1</math>  <math>m = -v/u</math>  <math>-1 = -v/u</math>  <math>u = v</math>  Hence, object is located at centre of curvature i.e., at distance of 40 cm from the pole of the mirror. (any other)</p> <p><b>Suggestive measures:</b>  The student needs to practice ray diagrams and the related numericals. While drawing a ray diagram the direction of the light ray must be shown and must be drawn by the pencil only.</p>	<p><math>\frac{1}{2} + \frac{1}{2}</math></p> <p>1</p> <p>1 (for direction)</p> <p>1</p> <p>1+1</p> <p>1</p> <p><math>\frac{1}{2}</math> <math>\frac{1}{2}</math></p>
<b>SECTION E</b>		
37	<p>Anvi is a young scientist with a burning curiosity. In her experiments, she discovers carbon's enchanting secret: ignites in oxygen, creating heat, light and carbon dioxide. Saturated hydrocarbons lit a clean flame, while unsaturated ones paint the air yellow, filling it with black smoke (sooty flame) Anvi's journey of discovery is a fiery adventure.</p> <p>(a) Complete the reaction: <math>\text{CH}_2\text{CH}_2\text{OH} + \text{O}_2 \rightarrow ?</math></p> <p>(b) State whether this combustion is an oxidation reaction or reduction reaction and why?</p> <p>(c) What is the reason for incomplete combustion? Name a clean fuel.</p> <p style="text-align: center;">OR</p>	



	<p>(c) State the molecular formula and the structural formula of the compound: But-2- yne.</p> <p>Ans.:</p> <p>(a) <math>\text{CH}_3\text{CH}_2\text{OH} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O} + \text{heat and light}</math></p> <p>(b) It is an oxidation type of reaction as oxygen get added to reactant. Eg: <math>\text{C} + \text{O}_2 \rightarrow \text{CO}_2 + \text{heat and light}</math></p> <p>(c) When the supply of air is limited for combustion, then the fuel goes partial combustion which results in sooty flame. LPG/CNG.</p> <p style="text-align: center;">OR</p> <p><math>\text{C}_4\text{H}_6</math></p> $  \begin{array}{c}  \text{H} \qquad \qquad \text{H} \\    \qquad \qquad   \\  \text{H}-\text{C}-\text{C}\equiv\text{C}-\text{C}-\text{H} \\    \qquad \qquad   \\  \text{H} \qquad \qquad \text{H}  \end{array}  $ <p><b>Suggestive measures:</b> In such questions student need to read the case and do not search for answer in the given para. The paragraph is for the context purpose and for using data if any available in the paragraph.</p>	<p>1</p> <p>½ + ½</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>
38	<p>Sex determination is the method by which distinction between males and females is established in a species. The sex of an individual is determined by specific chromosomes are called sex chromosomes. The normal chromosomes other than the sex chromosomes of an individual are known as autosomes.</p> <p>(a) A couple has two daughters. What is the probability of their having a girl next time?</p> <p>b) What is the number of autosomes present in liver cells of a human female?</p> <p>(c) Mention the sex chromosome pair present in a zygote which determines the sex of: (i) a female child and (ii) a male child.</p> <p style="text-align: center;">OR</p> <p>(c) Differentiate between asexual and sexual reproduction in reference to gamete formation.</p>	

	<p>Ans.:</p> <p>(a) The possibility of having a girl or boy child is equal i.e., 50%, as 50% male gametes are Y type and 50% are X type. Fusion of egg with X type sperm will produce a girl child.</p> <p>(b) In humans, number of autosomes are <math>2n = 44</math> or 22 pairs regardless of the sex.</p> <p>(c) (i) XX-Female child (ii) XY-Male child</p> <p style="text-align: center;">OR</p> <p>(c) Asexual reproduction: Gametes are not formed hence fertilisation does not take place.</p> <p>Sexual reproduction: Gametes are always formed and fertilisation takes place to form a zygote.</p> <p><b>Suggestive measures:</b> In such questions student need to read the case and do not search for answer in the given para. The paragraph is for the context purpose and for using data if any available in the paragraph.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>
39	<p>In a house 3 bulbs of 100 watt each lighted for 5 hours daily, 2 fans of 50 watt each used for 10 hours daily and an electric heater of 1.00 kW is used for half an hour daily.</p> <p>(a) What would be arrangement of the 3 electric bulbs so that the electrical power consumed by them is minimum?</p> <p>(b) State one difference between kilowatt and kilowatt hour.</p> <p>(c) Calculate the total energy consumed by bulbs and fans in one day for the house.</p> <p style="text-align: center;">OR</p> <p>(c) What is heating effect of current? List two electrical appliances which work on this effect.</p> <p>Ans.:</p> <p>(a) Power consumed is minimum when current through the circuit is minimum, so the 3 bulbs, are connected in series.</p> <p>(b) kilowatt is unit of power and kilowatt hour is a unit of energy.</p> <p>(c) Power of each bulb <math>P = 100</math> watt Total power of 3 bulbs,</p>	<p>1</p> <p>1</p>

