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**CBSE Class 10 Science**  
**Sample Paper - 03**

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**Maximum Marks: 80**

**Time Allowed: 3 hours**

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**General Instructions:**

- i. The question paper comprises three sections – A, B and C. Attempt all the sections.
  - ii. All questions are compulsory.
  - iii. Internal choice is given in each section.
  - iv. All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.
  - v. All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50 - 60 words each.
  - vi. All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80 – 90 words each.
  - vii. This question paper consists of a total of 30 questions.
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**Section A**

1. Translate the following statement into a chemical equation and then balance it :  
Hydrogen gas combines with nitrogen to form ammonia.
2. By considering their position in the periodic table, which one of the following elements would you expect to have maximum metallic characteristic?  
Ga, Ge, As, Se and Br
3. **Answer the questions that follows on the basis of your understanding of the following paragraph and the related studied concepts:**

It is easy to see that solar cooker devices are useful only at certain times during the day. This limitation of using solar energy is overcome by using solar cells that convert

solar energy into electricity. A typical cell develops a voltage of 0.5–1 V and can produce about 0.7 W of electricity when exposed to the Sun. A large number of solar cells are, combined in an arrangement called solar cell panel that can deliver enough electricity for practical use. The principal advantages associated with solar cells are that they have no moving parts, require little maintenance and work quite satisfactorily without the use of any focussing device. Another advantage is that they can be set up in remote and inaccessible hamlets or very sparsely inhabited areas in which laying of a power transmission line may be expensive and not commercially viable.



- i. What type of source of energy is mentioned in the above picture?
  - ii. For what purpose solar panels are used?
  - iii. Write the three advantages of solar cells.
  - iv. Why solar cooker surface is painted with black colour?
4. Following questions are based on the two tables given below. Study these tables related to blood sugar levels and answer the questions that follow.

**Table A (Blood glucose chart)**

	Mean Blood Glucose Level (mg/dL)
Doctor's advice needed	380
	350
	315
	280
	250

	215
Good	180
	150
Excellent	115
	80
	50

**Table B (Blood Report of Patient X and Y)**

Time of check	Blood Glucose ranges (mg/dL)	
	Patient X	Patient Y
Before breakfast (Fasting)	<100	70-130
Before lunch, supper and snack	<110	70-130
Two hours after meals	<140	<180
Bedtime	<120	90-15

Answer the following questions:

- Refer to Table B showing the blood report of the levels of glucose of patients X and Y. Infer the disease which can be diagnosed from the given data.
- Identify the hormone whose level in the blood is responsible for the above disease.
- Which one of the following diets would you recommend to the affected patient?
  - High sugar and a low-fat diet.
  - Low sugar and high protein diet.
  - High Fat and low fibre diet.
  - Low sugar and high fibre diet.
- Refer to Table A and suggest the value of the mean blood glucose level beyond which doctor's advice is necessary:
  - 80 mg/dL
  - 115 mg/dL
  - 50 mg/dL

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iv. 80 mg/dL

5. Rainbow is formed due to combination of?

- A. Refraction
- B. Absorption
- C. Dispersion
- D. Total internal reflection

- a. A and B
- b. A and C
- c. C and D
- d. A, B and C

**OR**

A boy uses spectacles of focal length – 50cm. Hence the defect of vision, he is suffering from-

- a. Far-sightedness
- b. Myopia
- c. Hypermetropia
- d. Presbyopia.

6. Which of the following is water harvesting structures in Kerala

- a. surangams
- b. nadis
- c. bundhis
- d. Kattas

7. The magnetic field lines due to straight wire carrying a current are-

- a. Parabolic

- 
- b. Straight
  - c. Circular
  - d. Elliptical

8. Which of the following properties are shown by dilute hydrochloric acid-

- A. It turns blue litmus red
- B. It turns red litmus blue
- C. It reacts with zinc metal and a gas evolves
- D. It reacts with solid sodium carbonate to give brisk effervescence

- a. A, B and D
- b. A, C and D
- c. A and B
- d. A and C

**OR**

What happens when dilute HCl is slowly added to copper oxide in a beaker?

- a. solution turns blue-green
- b. solution turns green
- c. solution turns blue
- d. solution turns brown

9. The ecosystem of earth is known as:

- a. Association
- b. Biome
- c. Biosphere
- d. Community

10. The driving force of an ecosystem is:

- a. Biomass
- b. Producers
- c. Solar energy
- d. Carbohydrates in plants

11. Which of the following is not the limitation of Mendeleev's periodic table?

- a. There was no place for isotopes in the periodic table.
- b. A correct position could not be assigned to hydrogen in the periodic table.
- c. Wrong order of atomic masses of some elements could not be explained.
- d. He left gaps for yet to be discovered elements.

12. Match the following with the correct response:

(1) Electrolytic reduction	(A) Sodium
(2) Electrolytic refining	(B) Zinc
(3) Reduction with carbon	(C) Impure copper
(4) Reduction with aluminium	(D) Chromium

- a. 1-C, 2-B, 3-D, 4-A
- b. 1-A, 2-C, 3-B, 4-D
- c. 1-B, 2-D, 3-A, 4-C
- d. 1-D, 2-A, 3-C, 4-B

13. **Assertion:** Graphite is slippery to touch.

**Reason:** The various layers of carbon atoms in graphite are held together by weak van der Waal's forces.

- a. Both assertion and reason are CORRECT and reason is the CORRECT explanation of

the assertion.

- b. Assertion is INCORRECT but, reason is CORRECT.
- c. Assertion is CORRECT but, reason is INCORRECT.
- d. Both assertion and reason are CORRECT but, reason is NOT THE CORRECT explanation of the assertion.

14. **Assertion:** Wire A is thin in comparison to wire B of same material same length then resistance of wire A is greater than resistance of wire B.

**Reason :** Resistivity of wire A is greater than resistance of wire B.

- a. Assertion is INCORRECT but, reason is CORRECT.
- b. Assertion is CORRECT but, reason is INCORRECT.
- c. Both assertion and reason are CORRECT but, reason is NOT THE CORRECT explanation of the assertion.
- d. Both assertion and reason are CORRECT and reason is the CORRECT explanation of the assertion.

### Section B

15. i. A chemical compound X is used in glass and soap industry. Identify the compound and give its chemical formula.
- ii. How many molecules of water of crystallisation are present in compound X?
- iii. How will you prepare the above compound starting from sodium chloride? Write all relevant equations involved in the process.
16. Explain the following in terms of gain or loss of oxygen with two examples each: (a) Oxidation (b) Reduction.

OR

Give the chemical reaction when  $\text{CO}_2$  gas is passed over lime water? What kind of a chemical reaction is this? What will happen if excess of  $\text{CO}_2$  gas is passed through limewater?

17. Consider the part of periodic table given below and answer the following questions.

Group→								
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Period↓	1	2	13	14	15	16	17	18
1	a							j
2	b	e				g	h	k
3	c			f			i	l
4	d							

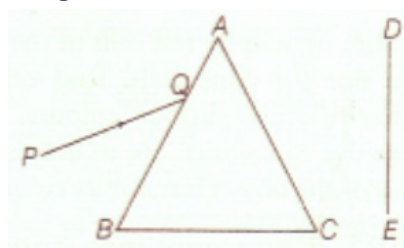
- The atom of which element is smaller in size e or h?
- Which element is the most electropositive in nature?
- Which element has only one proton in its atom?
- What is the valency of g?
- How many valence electrons does g have?
- Name the element which is a metalloid.

18. How is food transported in plants?

**OR**

Mention two ways in which the roots hairs are suited for absorption of water from soil.

19. A narrow beam PQ of white light is passing through a glass prism ABC as shown in the diagram.



Trace it on your answer sheet and show the path of the emergent beam as observed on the screen DE.

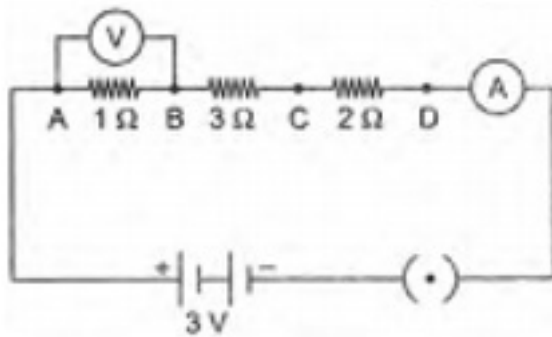
- Write the name and cause of the phenomenon observed.
- Where else in nature is this phenomenon observed?
- Based on this observation, state the conclusion which can be draw about the constituents of white light.

20. During which stage can the chromosomes be seen clearly. Write the features of the

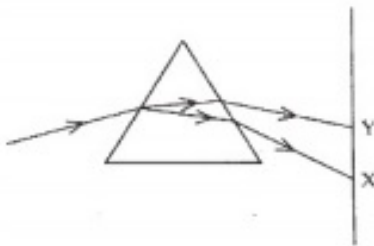


eukaryotic and prokaryotic chromosomes.

21. What is the function of receptors in our body? What happens when receptors do not work properly?
22. What is the role of the split ring in an electric motor?
23. i. Draw a schematic diagram of a circuit consisting of a cell of 1.5 V, 10-ohm resistor and 15-ohm resistor and a plug key all connected in series.  
ii. How would the reading of voltmeter (V) change, if it is connected between B and C as mentioned in the given below circuit diagram? Justify your answer.



24. In the figure given below, a narrow beam of white light is shown to pass through a triangular glass prism. After passing through the prism, it produces a spectrum XY on the screen.



- i. Name the phenomenon.  
ii. State the colours seen at X and Y.  
iii. Why do different colours of white light bend at different angles through a prism?

**OR**

- i. Name the spherical mirror used as:  
a. shaving mirror  
b. Rearview mirror in vehicles

- c. Reflection in search-light.
- ii. Write any three difference between a real and a virtual image.

**Section C**

25. i. How do you classify elements into metals and non-metals on the basis of their electronic configuration? Choose metal and non-metal out of the following:  
 ${}_{11}^{23}A, {}_9^{19}B, {}_{12}^{24}C, {}_{15}^{31}D, {}_{17}^{35}E$
- ii. What type of bond will be formed if
- 'A' combines with 'B'?
  - 'A' combines with 'E'?
  - 'C' combines with 'E'?
  - 'D' combines with 'E'?
26. i. How is vinegar made?
- ii. What is glacial acetic acid? What is its melting point?
- iii. Why is butanoic acid a weak acid?
- iv. Write the name and the formula of the two compounds formed when the ester,  $\text{CH}_3\text{COOC}_2\text{H}_5$  undergoes saponification.
27. Define nutrition. What are the different modes of nutrition?
28. a. What is reproduction? List its two types.
- b. Write the difference between modes of reproduction unicellular and multicellular organisms?

**OR**

- What is reproduction? List its two types.
  - Write the difference between modes of reproduction unicellular and multicellular organisms?
29. What is the potential difference between two points in the electric field ? Name and define its SI unit.
30. How are the images formed when an object is moved from infinity to the convex lens?

**OR**

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A student wants to project the image of a candle flame on the walls of the school laboratory by using a mirror.

- i. Which type of mirror should he use and why?
- ii. At what distance, in terms of focal length  $f$  of the mirror, should he place the candle flame to get the magnified image on the wall?
- iii. Draw a ray diagram to show the formation of the image in this case.
- iv. Can he use this mirror to project a diminished image of the candle flame on the same wall State 'how' , if your answer is 'yes' and why not', if your answer is 'no'.

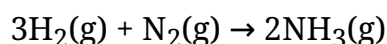
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**CBSE Class 10 Science**  
**Sample Paper - 03**

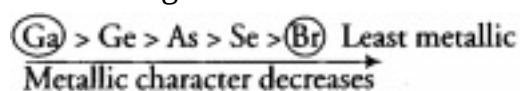
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**Answer**  
**Section A**

1. Hydrogen gas combines with nitrogen to form ammonia.



2. Given elements belong to the same period. Since, on moving from left to right, size decreases due to increase in nuclear charge. Due to this, the tendency to lose electrons decreases along the period. Hence, the metallic character of elements also decreases. Decreasing order of metallic character of metals follows the order:



Thus, Ga possesses maximum metallic character.

3. i. It is a renewable source of energy.  
ii. To produce electricity, solar panels are used.  
iii. The three advantages of solar cells are as follows:  
a. Have no moving parts.  
b. Require little maintenance.  
c. It can be set up in remote areas.  
iv. Solar cooker surface is painted with black because it is better absorber of heat.
4. a. Diabetes  
b. (b) Insulin  
c. (iv) low sugar high fibre diet  
d. (i) 180mg/dL
5. (c) C and D

**Explanation:** The rainbow is a natural spectrum of sunlight appearing in the sky after a rain shower. It is formed due to the **dispersion** of sunlight by the tiny water droplet, present in the atmosphere. Water droplet act like a prism. It refract and disperse the incident sunlight, then reflect it internally (**total internal reflection**) and finally refract it again, when it emerges out of the water droplet. Red colour appear on top & violet at the

bottom of rainbow.

**OR**

(b) Myopia

**Explanation:** By convention, focal length of concave lens is taken as negative. For correction of myopic eye or near-sighted eye, a concave lens is used.

6. (a) surangams

**Explanation:** Surangams is a water harvesting structure in the northern Malabar region of Kerala. This is an area whose people cannot depend directly on surface water. The terrain is such that there is high discharge in rivers in the monsoon and low discharge in the dry months. People here depend, therefore on groundwater, and on a special water harvesting structure called surangam.

7. (c) Circular Explanation: The nature of the magnetic field lines around a straight current carrying conductor is concentric circles with centre at the axis of the conductor.

8. (b) A, C and D

**Explanation:** HCl being an acid turns blue litmus red.

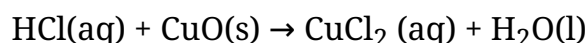
HCl reacts with zinc metal to evolve hydrogen gas.

HCl reacts with solid sodium carbonate ( $\text{Na}_2\text{CO}_3$ ) to evolve carbon dioxide ( $\text{CO}_2$ ) gas.

**OR**

(a) solution turns blue - green

**Explanation:** When Cl reacts with copper oxide, a blue green solution of copper (II) chloride is formed. The reaction is as follows:



This is a double replacement reaction. The soluble Copper(II) Chloride is blue-green in color and is responsible for the color of the solution formed.

9. (c) Biosphere

**Explanation:** The ecosystem of the earth is known as **biosphere**. The term "biosphere" was coined by geologist Eduard Suess in 1875, which he defined as the place on Earth's surface where life dwells.

10. (c) Solar energy

**Explanation:** The driving force of an ecosystem is solar energy. A food chain in an ecosystem always starts with photosynthesis. The autotrophs or the producers are at the first trophic level. They fix up the solar energy and make it available for heterotrophs or the consumers.

11. (d) He left gaps for yet to be discovered elements.

**Explanation:** Instead of limitation, it is one of the greatest merits of Mendeleev's periodic table. He had already predicted the existence of some elements that had not been discovered at that time. When these elements were discovered later on, they were placed in those gaps, without disturbing the existing elements.

12. (b) 1-A, 2-C, 3-B, 4-D

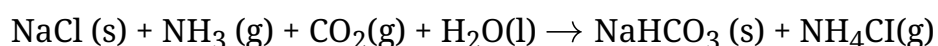
**Explanation:** Highly reactive metals like **sodium**, which cannot be obtained by reducing their oxides with carbon, are obtained by electrolysis of their chlorides (**electrolytic reduction**) in molten state. **Electrolytic refining** is used for refining impure copper. **Zinc oxide** can be reduced with **carbon** (or coke). **Chromium** can be obtained from its oxide ore by **reduction** with **aluminium powder**.

13. (a) Both assertion and reason are CORRECT and reason is the CORRECT explanation of the assertion. Explanation: Both assertion and reason are CORRECT and reason is the CORRECT explanation of the assertion.

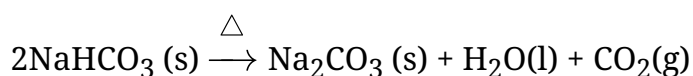
14. (b) Assertion is CORRECT but, reason is INCORRECT. Explanation: Assertion is CORRECT but, reason is INCORRECT.

### Section B

15. i. The compound (X) is washing soda. Its chemical formula is  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$   
ii. Ten molecules of water of crystallisation are present in this compound.  
iii. Ammonia and carbon dioxide gas in passed through brine (or concentrated sodium chloride solution) then a mixture of  $\text{NaHCO}_3$  and  $\text{NH}_4\text{Cl}$  is formed.

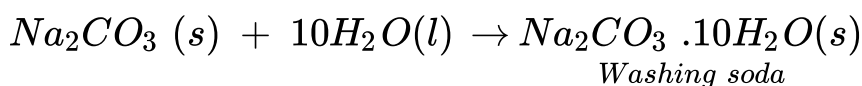


On Heating  $\text{NaHCO}_3$ , sodium carbonate is formed releasing water and carbon dioxide

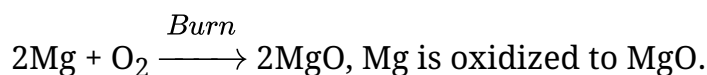
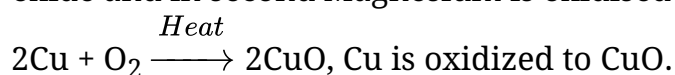


Anhydrous sodium carbonate (also known as soda ash) is dissolved in water. The solution is recrystallized and upon cooling, it gives hydrated sodium carbonate

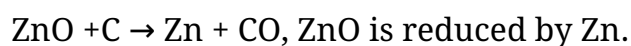
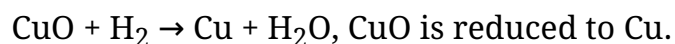
(called washing soda).



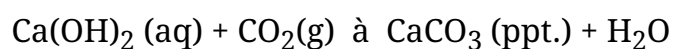
16. **a) Oxidation:** It is a chemical reaction in which gain of oxygen or loss of hydrogen takes place. For example in the first reaction copper is oxidised to become copper oxide and in second Magnesium is oxidised to become Magnesium Oxide.



**b) Reduction :** It is a chemical reaction in which loss of oxygen or gain of hydrogen takes place. For example in the first reaction copper oxide is reduced to become copper and in second Zinc Oxide is reduced to become Zinc.



**OR**



The above reaction is a combination as well as an exothermic reaction.

In case, excess of  $CO_2$  gas is passed through limewater, the milkiness formed due to the insoluble calcium carbonate ( $CaCO_3$ ) disappears.

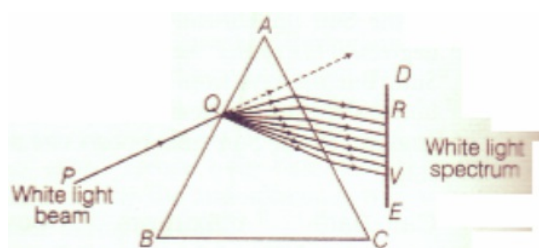
17. i. As we move from left to right across a period atomic size decreases thus element h has smaller size as compared to e.
- ii. Electropositive character decreases across a period and increases down the group thus elements a, b, c, d all are kept in same period, hence d is most electro positive in nature.
- iii. Hydrogen atom has only one proton in its atom. Its atomic number is 1.
- iv. As 'g' belongs to 16 group, number of valence electrons it has is '6'. It requires 2 electrons to complete its octet, therefore its valency is 2.
- v. element g have 6 valence electrons in its outer most shell. The electronic configuration is 2,6.
- vi. Element 'f' is germanium and it is a metalloid.

18. Food is transported in plants through phloem which consists of sieve tubes and companion cells. The food prepared in leaves is in the soluble form i.e, glucose. Active transport of food passes it to all other parts of plants.

OR

- i) Large surface area.
- ii) Cell membrane enclosing cell sap to facilitate endosmosis.

19.



- i. The phenomenon of splitting of white light into its constituent colours is called dispersion of light. It is caused due to difference in speed of constituent colours of light travel in the medium other than air/vacuum because of different speed they bend at different angles.
  - ii. In nature, this Phenomenon is observed in formation of rainbow where all the seven colours constituting white light is visible.
  - iii. Based on phenomenon of dispersion, we can conclude that
    - a. White light consists of seven colours. Violet, indigo, blue, green, yellow, orange and red.
    - b. Violet light suffers maximum deviation and red light suffers minimum deviation.
20. Chromosomes are distinctly visible during the Metaphase stage of mitosis of a cell. The features of eukaryotic and prokaryotic chromosomes are as follows

### **Eukaryotic chromosomes**

- i. They are present in large numbers.
- ii. In higher organisms, it occurs in paired condition.
- iii. They are visible distinctly only during the metaphase stage of mitosis.
- iv. Each chromosome consists of two chromatids attached together by a centromere.

### **Prokaryotic chromosomes**

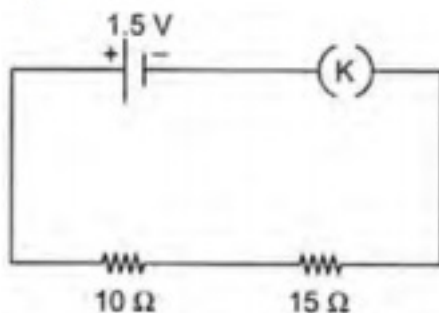


- i. They are simple in composition when compared to the eukaryotic chromosomes.
- ii. They are generally circular in shape.
- iii. They is only one chromosome in a cell.

21. The function of receptors is to detect information form the environment. If receptors do not work properly, the information obtained form the environment will be delayed to reach the spinal cord or brain. In this situation, the response to the environmental stimulus will be delayed causing harm to the body.

22. The split ring act as a commutator in D.C. motor i.e. it is a device which reverse the direction of current through the circuit after every half cycle.

23. i. The schematic circuit diagram is shown below:



ii.  $1\Omega, 3\Omega, 2\Omega$  resistances are connected in series.

$$R = R_1 + R_2 + R_3$$

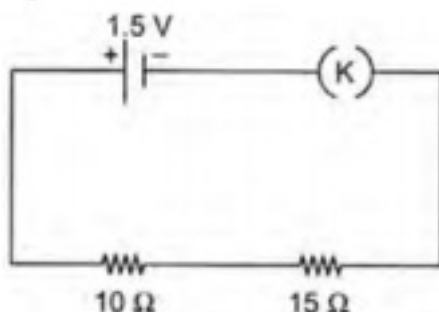
$$= 1 + 3 + 2 = 6\Omega$$

$$I = \frac{V}{R} = \frac{3}{6} = \frac{1}{2} \text{ A}$$

Current in each resistance is same, i.e.  $\frac{1}{2} \text{ A}$ .

Voltage across B & C =  $\frac{1}{2} \times 3 = \frac{3}{2} \text{ Volt}$ .

$$V_{BC} = \frac{3}{2} \text{ Volt}$$



24. i. The phenomenon is called dispersion.

ii. X — Violet Y — Red

iii. Different colours of white light bend through different angles with respect to the

incident beam of light due to difference in speed of light of different wavelengths.

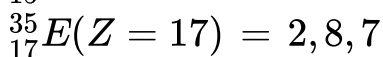
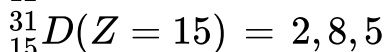
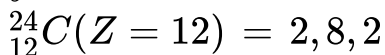
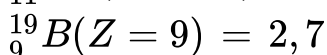
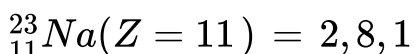
OR

- i. a) Shaving mirror- Concave mirror
- b) Rear view mirror - Convex mirror
- c) Reflection in search-lights - Concave mirror.
- ii. The three differences are:
  - a) Real image can be obtained on screen but a virtual image cannot be obtained.
  - b) Reflected/Refracted rays actually meet where the real image is formed while for virtual they only appear to meet.
  - c) A Real image is always inverted while the virtual image is always erect.

### Section C

25. i. Elements which contain 1 to 3 electrons in their outermost shell are metals.  
Elements containing 4 to 7 electrons in their valence shell are non-metals.

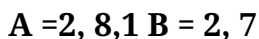
Electronic configurations:



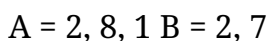
Hence A and C are metals whereas, B, D and E are non-metals.

- ii. Type of bonds

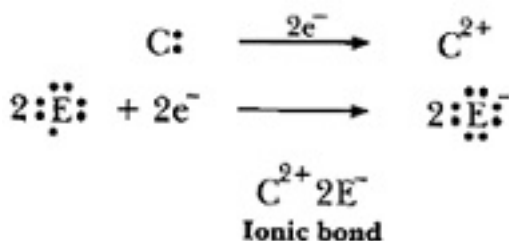
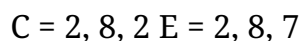
- a. 'A' is metal and 'B' is non-metal, so the bond formed will be ionic.



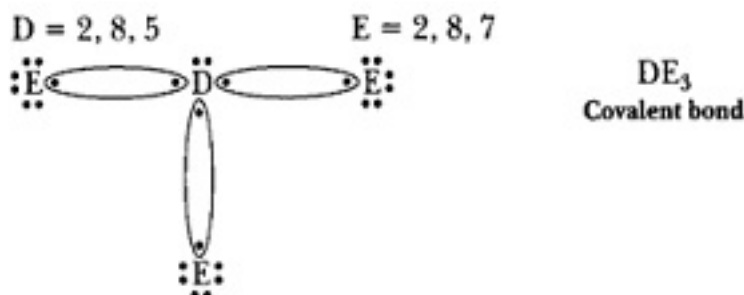
- b. 'A' is metal and 'E' is non-metal, so the bond formed is ionic.



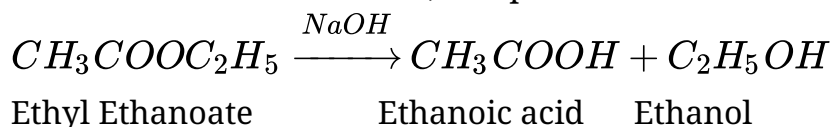
- c. 'C' is metal and 'E' is non-metal, so the bond formed is ionic.



- d. 'D' is a non-metal and 'E' is also a non-metal, so the bond formed will be covalent.



26. i. vinegar is made by adding 5-8 percent of water in acetic acid.  
 ii. Pure ethanoic acid is called glacial acetic acid because it form crystals at low temperature. It is a strong acid.  
 iii. Butanoic acid is a weak acid because it does not ionise completely.  
 iv. It is a reaction in which ester is heated in presence of a base (mainly NaOH) to give out ethanol & ethanoic acid, this process is used in making of soap.



27. **Nutrition:** The sum total of processes by which living organisms obtain food materials and prepare them for use in the growth, repair and providing energy is termed nutrition.

Nutrition is of two types: 1) Autotrophic nutrition, 2) Heterotrophic nutrition.

**1) Autotrophic nutrition:** The mode of nutrition in which an organism prepares its own food is called autotrophic nutrition. Mostly green plants have the ability to manufacture their own organic food due to the presence of chlorophyll. They take up  $CO_2$  and  $H_2O$  and manufacture carbohydrates in the presence of sunlight process called as photosynthesis. Such organisms are called autotrophs and their mode of nutrition is called autotrophic.

**2) Heterotrophic nutrition:** The mode of nutrition in which an organism takes food

from another organism is called heterotrophic nutrition. In this type of nutrition, the animals derive organic food materials by consuming bodies or products of other living or dead plants or animals.

28. a. **Reproduction**- It is a biological process by which new individual organisms (offspring) are produced from their parents.

Types of reproduction:-

- (i) Asexual reproduction
- (ii) Sexual reproduction

b.

Unicellular Organisms	Multicellular Organisms
Only one parent is required for reproduction.	Two parents are required for reproduction.
It is a fast process of reproduction.	Slower than unicellular organisms.
No specialized cells are required for reproduction.	Specialized cells are required for reproduction.

OR

- a. **Reproduction**- It is a biological process by which new individual organisms (offspring) are produced from their parents.

Types of reproduction:-

- (i) Asexual reproduction
- (ii) Sexual reproduction

b.

Unicellular Organisms	Multicellular Organisms
Only one parent is required for reproduction.	Two parents are required for reproduction.
It is a fast process of reproduction.	Slower than unicellular organisms.
No specialized cells are required for	Specialized cells are required for

29. Let a charge  $Q$  be moved from one point to the other, in the electric field and  $W$  be the work done, the potential difference  $V$  between two points is given by :

$$V = \frac{W}{Q} \text{ if } Q = +1\text{C, then } V = W$$

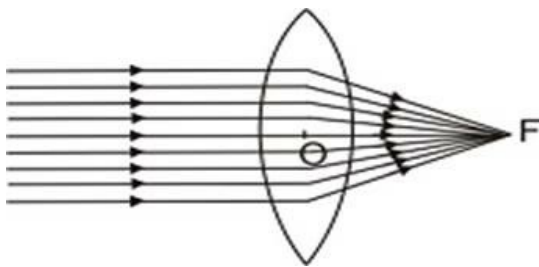
$\therefore$  the potential difference between two points in the electric field is defined as the amount of work done in moving a unit positive charge from one point to the other against electrostatic force due to electric field.

SI units of P.D. is volt. Potential difference between two points is said to be 1 volt if 1 J of the work is done in moving a charge of 1 C from one point to the other.

$$\text{Hence } 1 \text{ Volt} = \frac{1 \text{ Joule}}{1 \text{ Coulomb}}$$

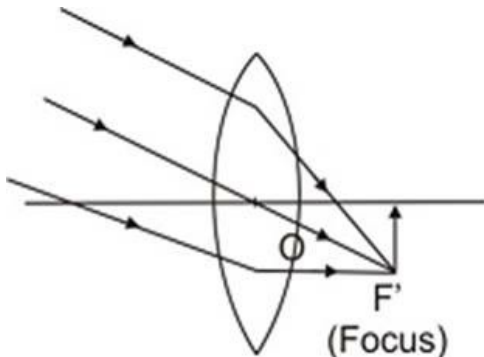
$$1 \text{ V} = 1 \text{ J/C} = 1 \text{ JC}^{-1}$$

30. Object at Infinity. When object is at infinity, a real image is formed at  $F$  on the other side of the lens

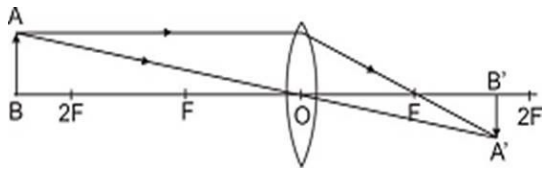


Object at infinity. Image at  $F$  on the other side of lens.

However if the rays are parallel to themselves but not parallel to principal axis, then these rays after refraction will form image at focus  $F'$  and not at principal focus  $F$ .

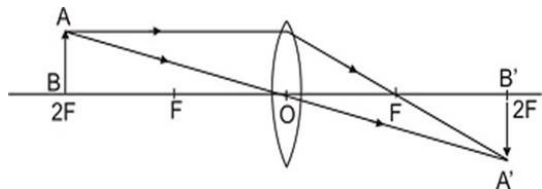


Object at infinity, rays parallel to themselves but not parallel to principal axis. Image is formed at  $F'$ , the focus on the other side of lens. Object beyond  $2F$ . When the object is beyond  $2F$ , a real, inverted, diminished image is formed between  $F$  and  $2F$ .

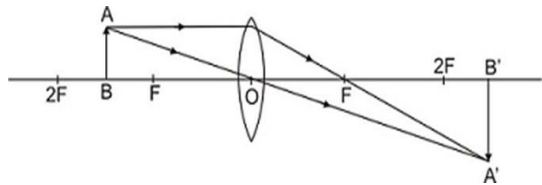


Object beyond  $2F$ , real, inverted, diminished image between  $F$  and  $2F$ . Object at  $2F$ .

When the object is at  $2F$ , a real, inverted image of the same size is formed on the other side of the lens at  $2F$  as given in Fig.

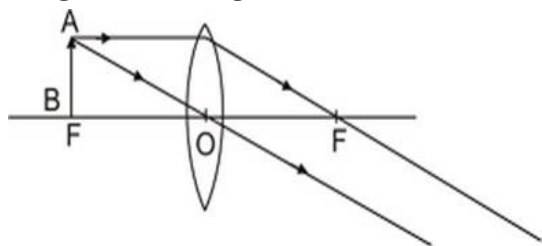


Object at  $2F$ , image at  $2F$  on the other side of the lens. Image is of size same as that of the object. When the object is between  $F$  and  $2F$ , its real, inverted, magnified image is formed on the other side of the convex lens as shown in fig.



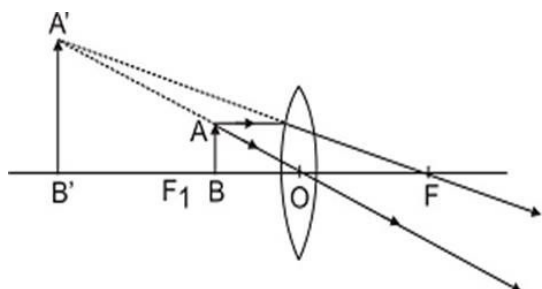
Object between  $F$  and  $2F$  real, inverted, magnified image is formed beyond  $2F$  on the other side of lens.

Object at  $F$ . When object is placed principal focus, a real, inverted, very highly magnified image is formed at infinity.



Object at  $F$ , a very highly magnified, real, inverted image is formed at infinity.

Object between  $F$  and  $C$ . When an object is placed between principal focus and optical centre of the lens, virtual, erect, magnified image is formed on the same side of the lens.

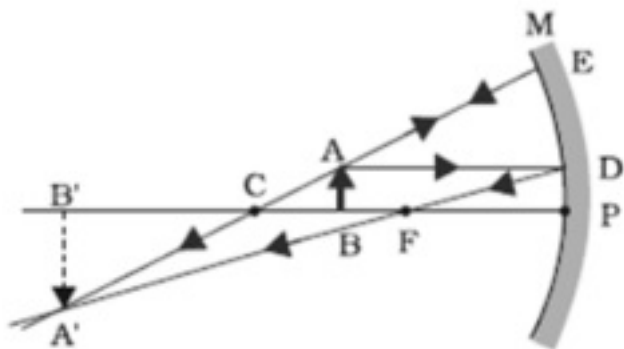


Object between  $F$  and  $C$ ; a virtual, erect, magnified image is formed on the same side.

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**OR**

- i. The student should use a Concave mirror because a concave mirror produces real images.
- ii. To get magnified image, the student should put the candle flame between  $f$  and  $2f$ .
- iii. The ray diagram will be as follows:



- iv. Yes, concave mirror can be used to obtain a diminished image. When the object is placed beyond  $2f$ , then the image formed will be diminished one.