SCIENCE

MOCK TEST PAPER

1

Practice Question Paper for
CBSE Class X Examination

Time : 2½ **M. Marks: 80**

General Instructions:

1. *The question paper comprises three sections – A, B and C. Attempt all the sections.*
2. *All questions are compulsory.*
3. *Internal choice is given in each section.*
4. *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. 5. All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50 - 60 words each.*
6. *All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80 – 90 words each.*
7. *This question paper consists of a total of 30 questions.*

Section 'A'

1. Give two characteristics of good fuel? **[1]**
2. Draw a ray diagram to show the path of the reflected ray corresponding to an incident ray which is directed parallel to the principal axis of a convex mirror. Mark on it the angle of incident and the angle of reflection. **[1]**
3. Four elements A, B, C and D along with their electronic configuration are given below : **[4]**

Elements	A	B	C	D
Electronic Configuration	2, 1	2, 8	2, 8, 1	2, 8, 8

Now answer the following questions :
(a) Which two elements belong to the same period ?
(b) Which two elements belong to the same group ?
(c) Which element out of A and C is more reactive?
(d) What is its valency ?

4. *Read the below passage and answer the following questions.* **[4]**

Every morning, a pharmacist from the nearby pharmacy visits Meena's house. He gives an injection to her grandmother and then proceeds towards her pharmacy. When asked, he told Meena that her grandmother is suffering from diabetes.

(a) What happens when a person suffers from diabetes?
(b) What complications may diabetes cause to Meena's grandmother?

(c) Name the hormone injected by the pharmacist to help Meena's grandmother.

(d) The hormone is secreted by

    (i) Adrenal gland   **(ii)** Pancreas

    (iii) Salivary gland   **(iv)** Liver

5. Which of the following are combination reactions?

    (i) $2KClO_3 \xrightarrow{\text{Heat}} 2KCl + 3O_2$ **(ii)** $MgO + H_2O \longrightarrow Mg(OH)_2$

    (iii) $4Al + 3O_2 \longrightarrow 2Al_2O_3$ **(iv)** $Zn + FeSO_4 \longrightarrow ZnSO4 + Fe$

    (a) Both **(i)** and **(iii)**   **(b)** Both **(iii)** and **(iv)**

    (c) Both **(ii)** and **(iv)**   **(d)** Both **(ii)** and **(iii)**   **[1]**

6. Where would you locate the element with electronic configuration 2, 8 in the modern periodic table?

    (a) Group 8   **(b)** Group 2   **(c)** Group 18   **(d)** Group 10   **[1]**

7. Factors responsible for the rapid spread of bread mould on slices of bread are

    (i) large number of spores.

    (ii) availability of moisture and nutrients in bread.

    (iii) presence of tubular branched hyphae.

    (iv) formation of round shaped sporangia.

    (a) (i) and (iii)   **(b)** (ii) and (iv)   **(c)** (i) and (ii)   **(d)** (iii) and (iv)   **[1]**

8. An example of homologous organs is

    (a) Our arm and a dog's fore-leg   **(b)** Our teeth and an elephant's tusks

    (c) Potato and runners of grass   **(d)** All of the above.   **[1]**

9. The phenomena of electromagnetic induction is

    (a) The process of charging a body.

    (b) The process of generating magnetic field due to a current passing through a coil.

    (c) Producing induced current in a coil due to relative motion between a magnet and the coil.

    (d) The process of rotating a coil of an electric motor.   **[1]**

10. Electrical resistivity of a given metallic wire depends upon

    (a) Its length   **(b)** Its thickness   **(c)** Its shape   **(d)** Nature of the material **[1]**

11. An aqueous solution turns red litmus solution blue. Excess addition of which of the following solutions would reverse the change?   **[1]**

    (a) Baking powder   **(b)** Lime

    (c) Ammonium hydroxide solution   **(d)** Hydrochloric acid

12. The most rapidly dwindling natural resource in the world is :   **[1]**

    (a) water.   **(b)** forest.   **(c)** wind.   **(d)** sunlight.

***Directions:** In the following questions (Q. 13 & Q. 14), a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:*

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

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

    (c) Assertion (A) is true but reason (R) is false.

    (d) Assertion (A) is false but reason (R) is true.

13. **Assertion:** Alloys have higher melting point than pure metals.

    Reason: Alloys do not get oxidized or burn readily at high temperatures.   **[1]**

14. Assertion: Microorganisms decay the dead bodies of plants and animals.

Reason: They clean the environment and return the nutrients back in an ecosystem. **[1]**

Section 'B'

15. The pH of a salt used to make tasty and crispy pakoras is 14. Identify the salt and write a chemical equation for its formation. List its two uses. **[3]**

16. 2 mL of sodium hydroxide is added to a few pieces of granulated zinc metal taken in a test tube. When the contents are warmed, a gas evolves which is bubbled through a soap solution before testing. Write the equation of the chemical reaction involved and test to detect the gas. Name the gas which will be evolved when the same metal reacts with dilute solution of a strong acid.

[3]

OR

Write the chemical formula of bleaching powder. Write balanced chemical equation involved in the preparation of bleaching powder and write its three uses.

17. Write the name and general formula of a chain of hydrocarbons in which an addition reaction with hydrogen can take place. Stating the essential conditions required for an addition reaction to occur, write the chemical equation giving the name of the reactant and the product of such a reaction. **[3]**

OR

Draw the electron dot structure of ethyne. A mixture of ethyne and oxygen is burnt for welding. Can we use a mixture of ethyne and air for this purpose? Give reason.

18. Distinguish between esterification and saponification reaction with the help of the chemical equations for each. State one use of each **(a)** esters, and **(b)** saponification reaction. **[3]**

19. Taking an example of an element of atomic number 16, explain how the electronic configuration of the atom of the element relates to its position in the modern periodic table and how valency of an element is calculated on the basis of its atomic number. **[3]**

20. List down three events, which occur during the process of photosynthesis. **[3]**

OR

List in tabular form three distinguishing features between autotrophic nutrition and heterotrophic nutrition.

21. What is carpel ? Write the function of its various parts. **[3]**

OR

List four methods of contraception used by humans. How does their use have a direct effect on the health and prosperity of a family?

22. A 10 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 12 cm. The distance of the object from the lens is 18 cm. Find the nature, position and size of the image formed. **[3]**

23. State how will you join three resistors, each of resistance 9 Ω so that equivalent resistance of the combination is **(i)** 13.5 Ω **(ii)** 6 Ω. **[3]**

24. What is fuse? Write down its importance in domestic electric circuit? **[3]**

OR

Draw a symbol of Rheostat, Voltmeter and Electric bulb.

Section 'C'

25. A carbon compound 'P' on heating with excess conc. H_2SO_4 forms another carbon compound 'Q' which on addition of hydrogen in the presence of nickel catalyst forms a saturated carbon compound 'R'. One molecule of 'R' on combustion forms two molecules of carbon dioxide and three molecules of water. Identify P, Q and R and write the chemical equations for the reactions involved. **[5]**

26. In the following table, six elements A, B, C, D, E and F of the modern periodic table with atomic numbers 3 to 18 are given: **[5]**

A	B	C	D	E	F	G	H
3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18

    (a) Which of these is **(i)** Noble gas **(ii)** halogen

    (b) Which of these is the most active metal in 3rd period?

    (c) Identify the most electronegative element in the third period.

    (d) In the compound between B and F, what type of bond will be formed?

    (e) What would be the nature of oxide formed by C?

27. How do Mendel's experiment show that

    (i) the traits may be dominant or recessive, and   **(ii)** different traits are inherited independently ? **[5]**

28. What are fossils? How fossils are formed and how is their age determined? State the importance of fossils in the study of evolution. **[5]**

29. **(a)** Draw a schematic labelled diagram of domestic electric circuit.

    (b) Why is it necessary to provide:

        (i) a fuse in an electric circuit.   **(ii)** an earth wire to electric application metallic body?
Explain. **[5]**

30. **(a)** List any three qualities of an ideal source of energy.

    (b) List two ways in which animal dung can be utilised as a fuel.

    (c) Out of these two, which one do you think is better? Justify your answer. **[5]**

SCIENCE

SOLUTION
MOCK TEST PAPER

1

CBSE Class X Examination

Section 'A'

1. It has higher heat of combustion, is smokeless and leaves no residue. **(Any two) [1]**

2.
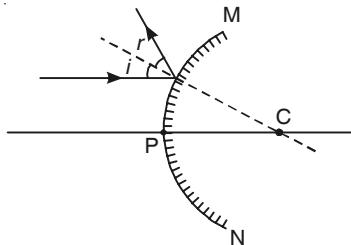
[1]

3. (a) A and B have same period (second period). C and D have same period (third period). **[1]**

   (b) A and C have one valence electron, so they belong to same group. **[1]**

   (c) C is more reactive because C is placed below A in the periodic table and reactivity increases down the group. **[1]**

   (d) The combining power or the combining capacity of an atom is called its valency. **[1]**

4. (a) When a person suffers from diabetes, his/her blood sugar level increases. **[1]**

   (b) If blood sugar is consistently high, over the time it can affect the heart, eyes, kidneys, nerves and other parts of the body. **[1]**

   (c) The injection given by the pharmacist is of insulin. **[1]**

   (d) (ii) It is a hormone secreted by pancreas, which helps in regulating blood sugar level. **[1]**

5. **(d)** Both **(ii)** and **(iii)** **[1]**

6. (c) Group 18 **[1]**

7. (c) (i) and **(ii)** **[1]**

8. (d) all the above **[1]**

9. (c) Producing induced current in a coil due to relative motion between a magnet and the coil **[1]**

10. (d) Nature of the material **[1]**

11. (d) Hydrochloric acid **[1]**

12. (b) Forest **[1]**

13. (b) Alloys have higher melting point than pure metals. So, the coils made from alloys do not melt or get deformed and alloys do not get oxidized or burn readily at high temperatures. **[1]**

14. (a) Microorganisms decay the dead bodies of plants and animals and therefore, clean the environment and return the nutrients back (to the soil and air in an ecosystem). **[1]**

Section 'B'

15. ● NaHCO$_3$ (Sodium Hydrogen Carbonate/Sodium Bicarbonate) **[1]**
  ● NaCl + H$_2$O + CO$_2$ + NH$_3$ → NH$_4$Cl + NaHCO$_3$ **[1]**
 **Uses:** For making baking powder.
    As ingredient of antacid.
   Soda-acid fire extinguisher. **(Any two) [½ + ½]**

16. When 2 mL of sodium hydroxide is added to a few pieces of granulated zinc metal taken in a test tube, hydrogen gas is evolved.
$$Zn + NaOH \longrightarrow Na_2ZnO_2 + H_2$$
Test for hydrogen: Bring a lit splint near the opening of the test tube. Remove the stopper to expose the splint to the gas. If the gas is hydrogen, it will ignite with a distinctive squeaky pop sound.
$$Zn + H_2SO_4 \text{ (dil)} \longrightarrow ZnSO_4 + H_2$$
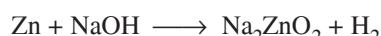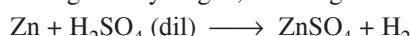
OR

Chemical formula – CaOCl$_2$
Chemical equation – Ca(OH)$_2$ + Cl$_2$ $\longrightarrow$ CaOCl$_2$ + H$_2$O
Uses of bleaching powder:
  (i) It is used in textile industry for bleaching cotton and linen.
 (ii) It is used as an oxidising agent in chemical industry.
**(iii)** It is used for disinfecting water. **[½ + 1 + 1 ½]**

17. Addition reaction with hydrogen can take place by:
  ● Alkene - C$_n$H$_{2n}$
  ● Alkyne - C$_n$H$_{2n-2}$
Essential conditions required for an addition reaction to occur are:
  ● Presence of multiple bonds between carbon atoms in the chain of hydrocarbon.
  ● Presence of catalyst such as nickel or platinum.
Chemical reactions are:

$$CH_2 = CH_2 + H_2 \xrightarrow{\text{Ni or Pt}} CH_3 - CH_3$$
  Ethene   Ethane

$$CH \equiv CH + 2H_2 \xrightarrow{\text{Ni or Pt}} CH_3 - CH_3$$
 Ethyne   Ethane **[1 + 1 + 1]**

OR
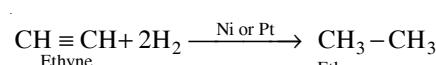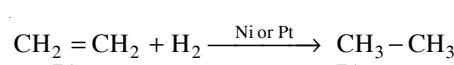
Electron dot structure of ethyne:
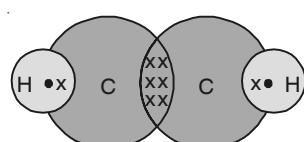
When ethyne is burnt with oxygen, it gives a clean oxyacetylene flame with temperature of around 3000° C because of complete combustion. This flame is used for welding.

However, when ethyne is burnt with air, it gives a sooty flame, due to incomplete combustion caused by limited supply of oxygen obtained from air. Therefore, such an huge temperature is not attained. Thus, a mixture of ethyne and air is not used for welding purpose. **[1 + 2]**

18.

Ans 8L → ESTERIFICATION REACTION	SAPONIFICATION REACTION
1) In this reaction, alcohol (like ethanol) reacts with carboxylic acid (like CH_3COOH) to form esters & H_2O in the presence of sulphuric acid	1) In this reaction, alkaline (NaOH) hydrolysis of esters gives soap & alcohol. (salt) $CH_3COOC_2H_5 + NaOH \longrightarrow CH_3COONa + C_2H_5OH$

$CH_3COOH + C_2H_5OH \xrightarrow{\text{conc.} H_2SO_4} CH_3COOC_2H_5$ (Ethyl ethanoate) $+ H_2O$

<u>use</u>

(i) Esters → used in perfumes or as flavouring agents.

(ii) Saponification process → used to prepare soap.

CBSE Topper's Answer, 2017

19. Electronic configuration of element with atomic no. 16 is 2, 8, 6 **[1]**

Since it has 3 shells, the period no. will be 3 **[½]**

Since the no. of valence electrons is 6, the group no. will be 10 + 6 = 16 **[½]**

Valency of the element = 8 – valence electrons *i.e.*, 8 – 6 = 2 **[1]**

20. Three events which occur during photosynthesis are:

(i) Absorption of light energy by chlorophyll.

(ii) Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.

(iii) Reduction of carbon dioxide to carbohydrates. **[1 + 1 + 1]**

OR

Differences between autotrophic and heterotrophic nutrition are:

S.No.	Autotrophic Nutrition	Heterotrophic Nutrition
(*i*)	It is the process in which food is synthesized from simple inorganic raw materials such as CO_2 and water.	It is the process in which food is obtained indirectly from autotrophs.
(*ii*)	In this, presence of green pigments called chlorophyll is necessary.	In this, no pigment is required.
(*iii*)	Food is generally prepared during daytime.	Food can be prepared at all times.
(*iv*)	*e.g.* All green plants and some bacteria.	*e.g.* All animals and fungi.

(Any three) [1+1+1]

21. Carpels are female reproductive structures that produce egg cells and protect a developing baby plant, or embryo.

Three main parts of a carpel are:

 (i) Stigma: It is the top part of the carpel which receives the pollen grain during pollination. It is sticky in nature so that the pollen grains can cling onto it.

 (ii) Style: It is a long tube which joins the stigma with the ovary. The pollen tube grows and reaches the ovary through the style.

 (iii) Ovary: It is the reproductive organ of the carpel which produces the female gamete ovule. It is the main site where fertilisation takes place. **[1+ 1 + 1]**

<p align="center">**OR**</p>

Four methods of contraception are:

(i) Natural methods

(ii) Barrier methods

(iii) Oral contraceptive method

(iv) Surgical methods

Effects of contraception on the health and prosperity of a family are:

(i) Prevents unwanted pregnancies.

(ii) Reduces chances of transmission of sexually transmitted diseases such as AIDS.

(iii) Helps in family planning.

(iv) Prevents the chances of frequent pregnancies. **(Any two) [2+1]**

22. Given,

Height of object, h_0 = 10cm

Focal length, f = 12 cm

Object distance, u = –18cm

Using lens formula,

$$1/v + 1/u = 1/f$$
$$1/v = 1/12 – 1/18$$
$$1/v = 3/36 – 2/36$$
$$1/v = 1/36$$
$$v = 36 \text{ cm}$$

Now $m = v/u = h_i/h_o$

or $36/-18 = h_i/10$

$$h_i = -20 \text{ cm}$$

Nature of image: Magnified, real and inverted image. **[3]**

23. (i) To 9 ohm resistors in parallel connected to one 9 ohms in series
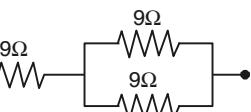

$$\frac{1}{R_p} = \frac{1}{9} + \frac{1}{9} = \frac{2}{9} \qquad \therefore \ R_p = \frac{9}{2}\Omega$$

$$R = 9\Omega + \frac{9}{2}\Omega = 13.5\Omega \qquad \qquad \textbf{[1½]}$$

(ii) To 9 ohm resistors in parallel connected to one 9 ohms in parallel

$R = 9\Omega + 9\Omega = 18\Omega$
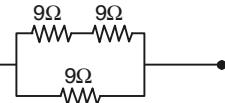
$\dfrac{1}{R} = \dfrac{1}{18} + \dfrac{1}{9} = \dfrac{3}{18}$ $\qquad \therefore \quad R = 6\Omega$ [1½]

Note: Deduct ½ mark if calculations are not given.

24. A fuse is a safety device having a wire of alloy of tin and lead with low melting points.

It is used so as to avoid the danger of electric short circuit and fires. When the current in wire increases due to overloading or short-circuit, the fuse wire become heated and melt. Hence, it breaks the circuit, thereby preventing overheating and electric fire. **[1 + 2]**

OR

Rheostat:
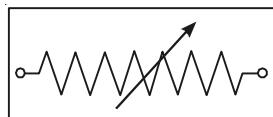
Voltmeter:
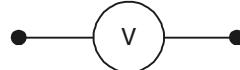
Electric bulb: **[1 + 1 + 1]**

Section 'C'

25. P = Ethanol (C_2H_5OH) $\qquad Q$ = Ethene ($CH_2 = CH_2$)

R = Ethane (C_2H_6) **[3 × ½]**

$$\underset{\text{Ethanol}}{C_2H_5OH} \xrightarrow[\text{443 K}]{\text{Conc H}_2\text{SO}_4} \underset{\text{Ethene}}{CH_2 = CH_2} + H_2O$$ **[1½]**

$$CH_2 = CH_2 \xrightarrow[\text{H}_2]{\text{Nickel Catalyst}} \underset{\text{Ethane}}{CH_3 - CH_3/C_2H_6}$$ **[1]**
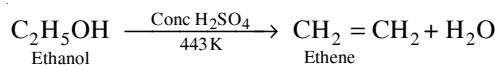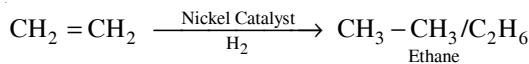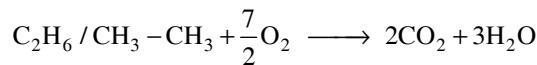
$$C_2H_6 / CH_3 - CH_3 + \dfrac{7}{2}O_2 \longrightarrow 2CO_2 + 3H_2O$$ **[1]**

26. (a) (i) Noble gas-G

(ii) Halogen-F **[½ + ½]**

(b) Most active metal-B **[1]**

(c) Most electronegative in 3rd period-F **[1]**

(d) Ionic bond **[1]**

(e) Oxide formed by C would be basic. **[1]**

27. (i) ● In the Mendel's experiments, when (pure) tall pea plants were crossed with (pure) dwarf pea plants, only tall pea plants were obtained in the F_1 generation. **[1]**

● On selfing the F_1 generation pea plants, both tall and dwarf plants were obtained in F_2 generation. **[½]**

● Appearance of all characters in F_1 and F_2 generation shows that the tallness is the dominant character and dwarfness which could not appear in F_1 but appeared in F_2 is a recessive character. **[1]**

(ii) ● When Mendel crossed tall pea plants with round seeds and a dwarf pea plant with wrinkled seeds, the F_1 progeny plants were all tall with round seeds. **[1]**

● On self-pollination of F_1 plants, the F_2 progeny consisted of both parental characters (tall plants with round seeds and dwarf plants with wrinkled seeds) as well as new combinations like tall plants with wrinkled seeds and dwarf plants with round seeds. **[1]**

● Thus, it may be concluded that tall and dwarf traits and round and wrinkled have been inherited independently. **[½]**

28. ● **Fossil:** Preserved traces of living organisms are called fossils. **[1]**

● Fossils are formed when the body parts of the dead organisms do not decompose completely and caught up in mud and eventually harden to retain the impression of the body parts. **[2]**

● **Age of the fossils can be determined by:**

(i) Relative method

(ii) Carbon dating method. **[½ + ½]**

● **Importance of fossils in the study of evolution:**

(i) Help us in knowing about the species which are no longer alive.

(ii) Provide evidence of missing links between two groups of organisms. **(Any one)** **[1]**

29. (a) A schematic labelled diagram of domestic electric circuit:
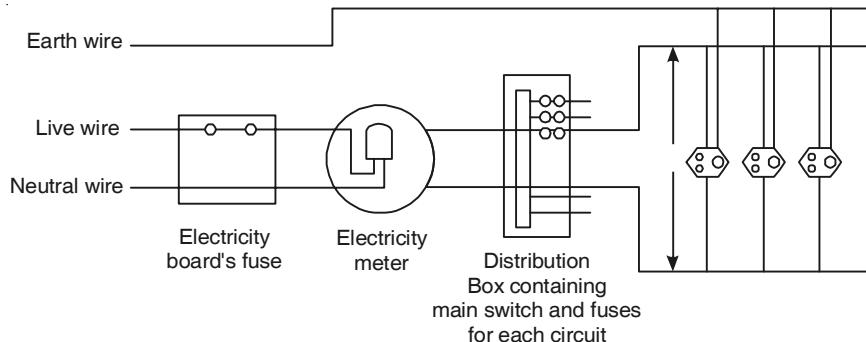
(b) (i) It prevents damage to appliance due to overloading or short-circuiting.

(ii) Earth wire is connected to a metallic body buried deep inside the earth. It is used as safety measure.

It provides a low resistance conducting path for the current. As a result, any leakage of current to a metallic body does not give shock to user. **[3 + 2]**

30. (a) Qualities of an ideal source of energy are:
    (i) Produces large amount of heat and energy.
    (ii) Easily accessible.
    (iii) Less or no production of toxic by-products.
  (b) Two ways are: as biogas or as cow dung cakes.
  (c) Biogas is better than cow dung. It is because of
    (i) high heating capacity of biogas and
    (ii) Non-polluting as it burns without smoke and leaves no residue like ash.   **[2+1+2]**

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2

Practice Question Paper for

CBSE Class X Examination

Time : 2½   **M. Marks: 80**

General Instructions:

1. *The question paper comprises three sections – A, B and C. Attempt all the sections.*
2. *All questions are compulsory.*
3. *Internal choice is given in each section.*
4. *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. 5. All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50 - 60 words each.*
6. *All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80 – 90 words each.*
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Section 'A'

1. The magnification produced by a plane mirror is m = +1. What does this mean?   **[1]**
2. Write down any one advantage of using jute or cloth bags over polythene bags?   **[1]**
3. *Read the passage given below and then answer the following questions.*   **[4]**

   In a village, few children have complained of swollen necks. A villager, Ram Singh is superstitious and he thinks that the village is cursed by a 'devil.' Sunil is another villager, who thinks it as a disease which needs consultation with a doctor.

   (a) What can be the reason behind swollen necks of the young children in the village?

   (b) Name the disease caused by the deficiency of this salt.

   (c) How can the problem be overcome?

   (d) The main function of hormones secreted by thyroid gland is that

       (i)   it regulates the carbohydrate, protein and fat metabolism.

       (ii)   it regulates blood sugar level.

       (iii)   it regulates growth and development of the body.

       (iv)   it controls structure and function of the body.

Fully Solved

4. In the given table, the position of three elements A, B and C in the periodic table are shown. Study the table carefully and answer the following questions. **[4]**

Group → / Period ↓	1	2	3
I	A		
II			C
III		B	
IV			
V			
VI			
VII			
VIII			

(a) Is element 'A' a metal or non-metal.

(b) Element 'B' has larger size than 'C'. Why?

(c) What is the valency of element 'C'?

(d) There are____I_____ horizontal rows known as _____II_____.

   (i) I- Seven, II- Periods   (ii) I- Eighteen, II- Groups

   (iii) I- Seven, II-Groups   (iv) I- Eighteen, II- Periods

5. Which one of the following can be used as an acid-base indicator by a visually impaired student?

(a) Litmus   (b) Turmeric

(c) Vanilla essence   (d) Petunia leaves   **[1]**

6. A uniform magnetic field exists in the plane of paper pointing from left to right as shown in figure. In the field an electron and a proton move as shown:
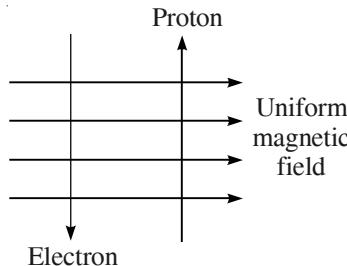
Where do the electron and the proton experience the force?

(a) Forces both pointing into the plane of paper.

(b) Forces both pointing out of the plane of paper.

(c) Forces pointing into the plane of paper and out of the plane of paper, respectively.

(d) Force pointing opposite and along the direction of the uniform magnetic field respectively.   **[1]**

7. A piece of wire of resistance R is cut into five equal parts. These parts are then connected in parallel. If the equivalent resistance of this combination is R', then the ratio R/R' is:

(a) 1/25   (b) 1/5   (c) 5   (d) 25   **[1]**

8. Which one of the following materials cannot be used to make a lens?

(a) Water   (b) Glass   (c) Plastic   (d) Clay   **[1]**

9. Accumulation of non-biodegradable pesticides in the food chain in increasing amount at each higher trophic level is known as

(a) Eutrophication   (b) Pollution   (c) Bio-magnification (d) Accumulation   **[1]**

10. Which of the following statements are true about the brain?

(i) The main thinking part of brain is hind brain.

(ii) Centres of hearing, smell, memory, sight, etc., are located in fore brain.

(iii) Involuntary actions like salivation, vomiting, blood pressure are controlled by the medulla in the hind brain.

(iv) Cerebellum does not control posture and balance of the body.

     (a) (i) and (ii)   **(b)** (i) (ii) and (iii)

     (c) (ii) and (iii)   **(d)** (iii) and (iv)   **[1]**

11. Which of the following terms does not represent electrical power in a circuit?

(a) I^2R (b) IR^2 (c) VI   (d) V^2/R **[1]**

12. SI unit of power is   **[1]**

(a) Dioptre   (b) Newton   (c) Hertz   (d) Ampere

Directions: In the following questions (Q. 13 & Q. 14), a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

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

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

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

13. Assertion: Metal sulphides and carbonates should be converted to metal oxides in the process of extraction of metal from them.

Reason: It is easier to obtain metals from their oxides (by reduction) than from carbonate or sulphide ores.   **[1]**

14. Assertion: A typical dicot embryo comprises an embryonal axis with two cotyledons.

Reason: Embryo has the ability to develop into a complete plant.   **[1]**

Section 'B'

15. A coil made of insulated copper is connected to a galvanometer. What will happen to the deflection of the galvanometer if this coil is moved towards a stationary bar magnet and then moved away from it? Give reasons for your answer and name the phenomenon involved?   **[1 + 1 + 1]**

16. The electronic configuration of an element 'X' is 2,8,6. To which group and period of the modern periodic table does 'X' belong. State its valency and justify your answer in each case.   **[1 + 1 + 1]**

OR

Name the functional group of organic compounds that can be hydrogenated. With the help of suitable diagram, explain the process of hydrogenation. Name any one natural source of organic compounds that can be hydrogenated.

17. An element 'M' has atomic number 12.

    (a) Write its electronic configuration and valency.

    (b) Is 'M' a metal or a non-metal ? Give reason in support of your answer.

    (c) Write the formula and nature (acidic / basic) of the oxide of M. **[3]**

18. (a) How is equal genetic contribution of male and female parents is ensured in the progeny.

    (b) In human beings, the statistical probability of getting either a male or a female child is 50%. Give reasons and explain with the help of a diagram.

19. (a) Define the following terms: **(i)** Valency **(ii)** Atomic size.

    (b) How do the valency and the atomic size of the elements vary while going from left to right along a period in the modern periodic table? **[3]**

20. State the laws of refraction of light. Explain the term 'absolute refractive index of a medium' and write an expression to relate it with the speed of light in vacuum.

<div align="center">**OR**</div>

What is hypermetropia (far sightedness)? Draw a ray diagram to show how this defect can be corrected using a lens? **[1 + 1 + 1]**

21. (i) What is the full form of **(a)** UNEP, **(b)** CFCs.

    (ii) On what basis, are organisms grouped as producers, consumers and decomposers.

    (iii) Write two problems that would arise if there were no decomposers in the ecosystem.

<div align="center">**OR**</div>

Suggest any five activities in your daily life which are eco-friendly. **[1+1+1+1]**

22. Draw the following diagram, in which a ray of light is incident on a concave/convex mirror, on your answer sheet. Show the path of this ray, after reflection in each case. **[3]**
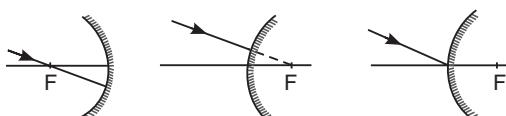

23. Name down the names and functions of the two parts of the dicotyledonous embryo. **[1 + 1]**

24. What is dam? How do we seek to build large dams? While building large dams, which three main problems should particularly be addressed to maintain peace among local people? Mention them.

<div align="right">**[½ + ½ + 1½]**</div>

Section 'C'

25. Elements forming ionic compounds attain noble gas electronic configuration by either gaining or losing electrons from their valence shells. Explain giving reason why carbon cannot attain such a configuration in this manner to form its compounds. Name the type of bonds formed in ionic compounds and in the compounds formed by carbon. Also, explain with reason why carbon compounds are generally poor conductors of electricity. **[5]**

26. What is sexual reproduction? Explain how this mode of reproduction gives rise to more viable variations than asexual reproduction. How does this affect the evolution? **[5]**

27. Define evolution. How does it occur? Describe how fossils provide us evidences in support of evolution? **[5]**

28. (a) What are dominant and recessive traits?

    (b) "Is it possible that a trait is inherited but may not be expressed in the next generation?" Give a suitable example to justify this statement. **[5]**

29. **(a)** How will you infer with the help of an experiment that same current flows through every part of a circuit containing three resistors in series connected to a battery?

(b) Consider the given circuit and find the current flowing in the circuit and potential difference across the 15 W resistor when the circuit is closed. **[5]**
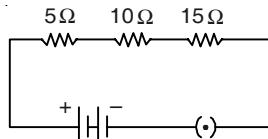
OR

(a) Three resistors R_1, R_2 and R_3 are connected in parallel and the combination is connected to a battery, ammeter, voltmeter and key. Draw suitable circuit diagram and obtain an expression for the equivalent resistance of the combination of the resistors.

(b) Calculate the equivalent resistance of the following network:
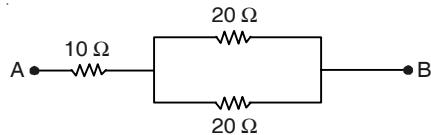
30. **(a)** Differentiate between biodegradable and non-biodegradable waste? **[5]**

(b) List any three ways by which you can save the environment?

OR

What is solar cell panel? Name two materials used for making solar cell. Write two uses and two limitations of solar panels.

SCIENCE

SOLUTION
MOCK TEST PAPER

Practice Question Paper for
CBSE Class X Examination

2

Section 'A'

1. + sign of m indicate that the image is erect and hence virtual. **[1]**

2. Jute bags are eco- friendly as they are biodegradable. **[1]**

3. **(a)** It is due to deficiency of iodine in food of the village children. **[1]**

   (b) The disease caused due to deficiency of iodine is Goitre. **[1]**

   (c) The problem can be overcome by adding iodine in food which can be done by consuming iodised salt in place of ordinary salt. **[1]**

   (d) **(i)** The hormone secreted by thyroid gland is thyroxin. It regulates carbohydrate, protein and fat metabolism in the body. **[1]**

4. **(a)** Element 'A' is a metal because it is present in group I (1 valence electron) and can lose electron easily. **[1]**

   (b) Element B has larger size than 'C' because it has more number of shells than 'C'. Also, B lies in the third period and has three shells whereas C lies in second period and has two shells. **[1]**

   (c) 'C' being an element of 3rd group has three valence electrons, therefore its valency is 3. **[1]**

   (d) **(i)** There are seven horizontal rows known as periods. **[1]**

5. **(c)** Vanilla essence **[1]**

6. **(a)** Forces both pointing into the plane of paper **[1]**

7. **(d)** 25. **[1]**

8. **(d)** Clay **[1]**

9. **(c)** Bio-magnification **[1]**

10. **(c)** (ii) and (iii) **[1]**

11. **(b)** IR^2 **[1]**

12. **(a)** Dioptre **[1]**

13. **(a)** It is easier to obtain metals from their oxides (by reduction) than from carbonate or sulphide ores. So, before reduction, the ore must be converted into metal oxide which can then be reduced. **[1]**

14. **(b)** Zygote, a fertilized egg gives rise to an embryo, which has the ability to develop into a complete plant. A typical dicot embryo comprises an embryonal axis with two cotyledons. **[1]**

Section 'B'

15. Oxidising agent: Alkaline potassium permanganate.

| Litmus test	Reaction with sodium	Hydrogen carbonate
Ethanol	No colour change	It does not react with $NaHCO_3$.
Ethanoic acid	Turns blue litmus red.	It reacts with $NaHCO_3$ give rise to CH_3COONa, CO_2 and H_2O

[1 + 2]

16. X : 2, 8, 6

(a) Since 'X' has three energy shells and period number of an element is equal to the number of energy shells, X belongs to 3rd period. **[1]**

(b) X has 6 valence electrons, it belongs to group 16. **[1]**

(c) Valency will be 2. To acquire noble gas configuration it will gain 2 electrons. **[1]**

OR

Functional group that can be hydrogenated are: alkene and alkynes.

Hydrogenation: It is the process in which hydrogen is added to unsaturated hydrocarbons in the presence of nickel (a catalyst) to yield saturated hydrocarbons.

$$\underset{R}{\overset{R}{>}}C=C\underset{R}{\overset{R}{<}} \quad \xrightarrow[\text{Nickel}]{H_2} \quad R-\underset{\underset{R}{|}}{\overset{\overset{H}{|}}{C}}-\underset{\underset{R}{|}}{\overset{\overset{H}{|}}{C}}-R$$
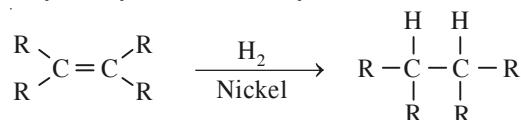
Natural source of organic compound that is hydrogenated is vegetable oil. **[1+1+1]**

17. (a) 2, 8, 2,   Valency : 2 **[½, ½]**

(b) ● Metal **[½]**

● There are two electrons to its outermost shell and it is easily loses them to form a positive ion. **[½]**

(c) ● MO **[½]**

● Basic **[½]**

18. Term used is Rancidity.

Antioxidants are substances which prevent oxidation.

When they are added to fat and oil containing food, the fats and oil do not get oxidised easily, hence, the food do not get rancid, thus remains good to eat for longer time. **[1 + 1 + 1]**

19. (a) (i) **Valency:** It is the combining capacity of an atom. It is equal to the number of electrons gained, lost or shared by an atom to achieve the nearest noble gas configuration.

(ii) **Atomic size:** It is the distance between the centre of the nucleus and the outermost shell of an isolated atom.

(b) On moving from left to right, valency increases up to 4 and then decreases.

Atomic size decreases along a period. **[2 + ½ + ½]**

20. First law: The incident ray, refracted ray and normal to the interface at the point of incidence lie in the same plane. **[1]**

Second law: The sine of angle of incidence bears a constant ratio with sine of angle of refraction

for a given pair of media. Or $\dfrac{\sin i}{\sin r}$ = constant **[1]**

Absolute Refractive Index of a medium = $\dfrac{\text{Speed of light in air or vacuum}}{\text{Speed of light in the medium}}$ **[1]**

OR

Hypermetropia is a defect of vision, whereby a person cannot see nearby objects, but he can see distant objects.

Hypermetropia can be corrected by using convex lens.
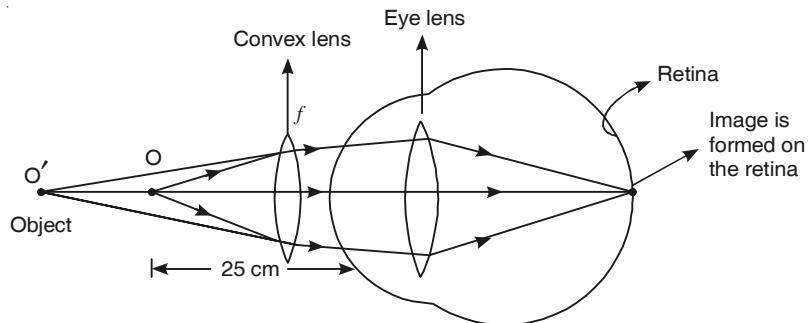
[1+2]

21. Vegetative reproduction is a mode of reproduction in which new plants are obtained from vegetative parts of the plants.

Advantages:

 (i) Seedless plant can be easily propagated by this method.

(ii) It is a cheaper, easier, and rapid method of propagation.

Potato and sugarcane can be grown by this method. **[1 + 1 + 1]**

OR

Diagram is as follows:
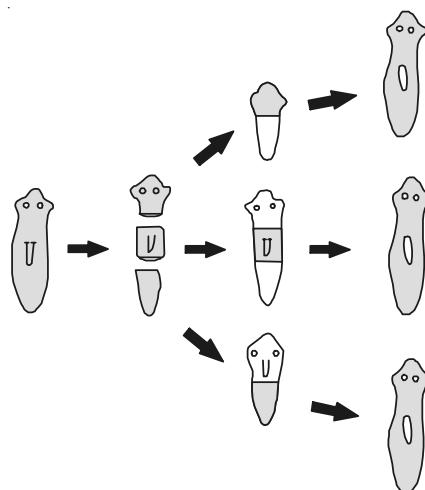
Regeneration can be observed in *Hydra* also. **[2 + 1]**

22.
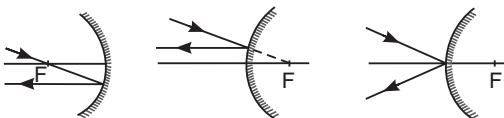
[3 × 1]

23. (a) Highest total resistance is obtained when resistance are connected in series.

$$R = R_1 + R_2 + R_3 + R_4$$
$$R = 4 + 8 + 12 + 24$$
$$R = 48\ \Omega$$

(b) Lowest total resistance is obtained when resistances are connected in parallel.

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4}$$

$$\frac{1}{R} = \frac{1}{4} + \frac{1}{8} + \frac{1}{12} + \frac{1}{24}$$

$$\frac{1}{R} = \frac{(6+3+2+1)}{24} = \frac{12}{24} = \frac{1}{2}\ \Omega \quad \text{or} \quad R = 2\ \Omega$$ [1½ + 1½]

OR

(a) The colour of the sky is blue during day time. Sky appear blue due to scattering of light by atmosphere. Blue colour gets scattered maximum due to shorter wavelength than red.

(b) The sky appears dark to passengers flying at a very high altitudes due to absence of atmosphere. As a result, scattering of light does not take place, as scattering of light takes place because of the particles present in atmosphere.   [1½ + 1½]

24. Dams are man-made structures which are built to control and collect water in flowing water bodies.

We build large dams so as to:

(i) Control flood and collect water for large irrigation projects.

(ii) To harness hydroelectric power.

(iii) Supply water during lean season.

Main problems that arise are:

(i) It leads to deforestation, which results in loss of biodiversity.

(ii) It may result in flooding of nearby towns and villages.

(iii) It leads of submergence of low lying adjoining areas, thereby affecting local populations.

[½ + 1 ½ + 1]

Section 'C'

25. Carbon has 4 electrons in its outermost shell. It cannot lose 4 electrons to form C^{4+} because very high energy is required to remove 4 electrons.   [1½]

It cannot gain 4 electrons to form C^{4+} ions because it is difficult for 6 protons to hold on to 10 electrons.

[1½]

(i) Ionic/Electrovalent Bonds   **[½]**

(ii) Covalent bonds.   **[½]**

(iii) There are no charged particles in carbon compounds and hence poor conductors of electricity. **[1]**

26. Sexual reproduction is the process of the production of new living organisms by combining genetic information from two individuals of different types (sexes).

   During sexual reproduction, at the time of gamete formation, meiotic cell division takes place. During meiosis, crossing over between fragments of homologous chromosomes occurs which brings about new gene combinations to be transferred to new generation. Crossing over is the fundamental cause of origin of variations in sexually reproducing organisms. Asexual reproduction does not involve meiosis and crossing over because of one parent lineage. Hence, only minute variations may occur in them due to mutation. The variations caused by crossing over in sexually reproducing organisms are subjected to the selection process. Natural selection selects those variations which have more adaptive value and guide them towards evolution of new species. In this way, sexual reproduction gives rise to more viable variations for evolution.   **[1+4]**

27. Evolution is a gradual process by which an organism becomes better adapted to the environment.

   It occurs through accumulation of variations in the genetic material for several generations, thereby leading to speciation.

   Fossils represent the ancestors of the plants and animals that are alive today. They provide evidence of evolution by revealing the characteristics of the past organisms and changes that have occurred in these organisms. For example, some invertebrates died and got buried in the soil around 100 million years ago. Gradually, more sediment got accumulated on top of the soil, turning it into sedimentary rock. At the same place, millions of years later, some dinosaurs died and their bodies got buried on top of the sedimentary rock. The mud containing dinosaurs also turned into a rock. Then, millions of years later, some horse like creatures died in that region and got fossilized in rocks above the dinosaur fossils. Sometimes later, due to soil erosion and floods in that area, the rocks containing horse like fossils get exposed. If that area is excavated deeper, then the dinosaur and invertebrate fossils can also be found. Thus, by digging that area, scientist can easily predict that horse like animals evolved later than the dinosaur and invertebrates.   **[1 + 1 + 2]**

28. **(a)** **Dominant trait:** Trait which appears in the F_1 porgeny, is dominant trait.

   Recessive trait: Trait which remains hidden or which does not appear in the F_1 progeny is recessive trait.

   **(b)** Yes, it is possible.

   Example: When pure tall pea plants are crossed with pure dwarf pea plants, only tall pea plants are obtained in F_1 generation.

   On selfing tall plants of F_1, both tall and dwarf plants are obtained in F_2 generation in the ratio 3 : 1.

   Reappearance of the dwarf character, a recessive trait in F_2 generation shows that the dwarf trait/character was present in individuals of F_1 but it did not expressed (due to the presence of tallness, a dominant trait/character).

Parents
Pure tall plant (TT)   X   Pure short plant (tt)

F_1 generation
(Tt)   (Tt)   (Tt)   (Tt)

Selfing of F_1
Tall plant (Tt)   X   Tall plant (Tt)

F_2 generation
(TT)   (Tt)   (Tt)   (tt)

[3 + 2]
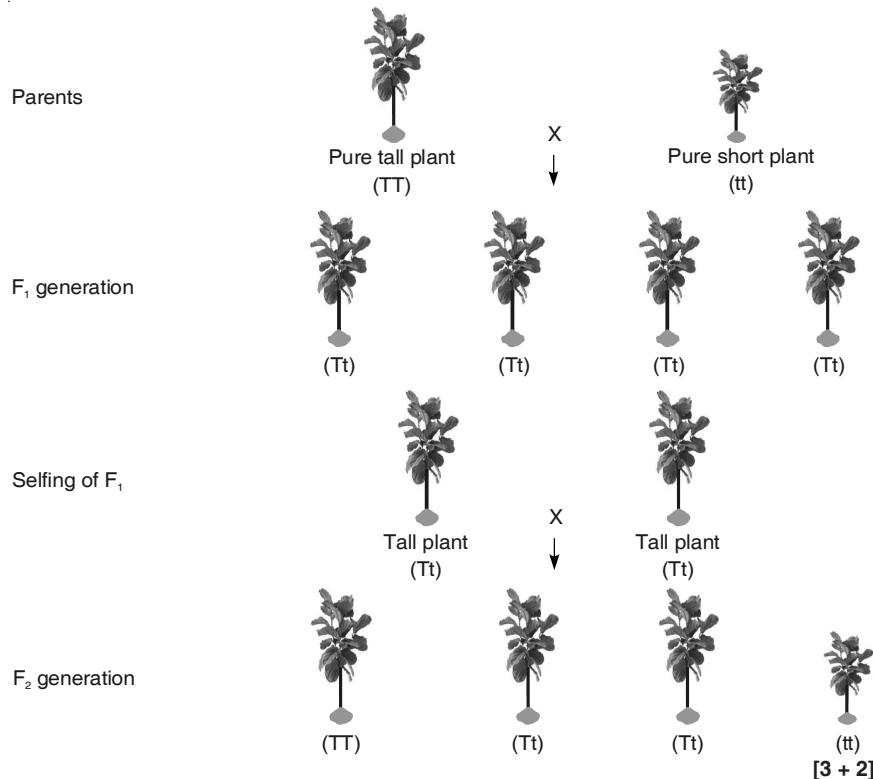
29. (a) Let the experimental set up comprises of three resistors R_1, R_2 and R_3 of three different values which are connected in series. Connect them with a battery, an ammeter and plug, a key, as shown in figure.
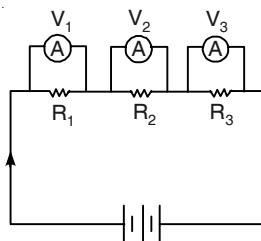
The key K is closed and the ammeter reading is recorded. Now, the position of ammeter is changed to anywhere in between the resistors again, the ammeter reading is recorded each time.

Note the readings of voltmeter, let us say they are V_1, V_2, V_3 respectively across R_1, R_2, and R_3.

Now, as per ohm's law, $I_1 = V_1/R_1$, $I_2 = V_2/R_2$, $I_3 = V_3/R_3$

It's observed that there was identical reading each time, which shows that same current flows through every part of the circuit containing three resistances in series connected to a battery

(b) $R_s = R_1 + R_2 + R_3 = 5 + 10 + 15 = 30$ ohm

Since, $V = IR$ or $30 = I \times 30$

or $I = 30/30 = 1$ Ampere

Potential difference across 15 ohm resistor,

$$V = IR$$
$$V = 1 \times 15 = 15 \text{ V}$$ **[3+2]**

OR

(a)
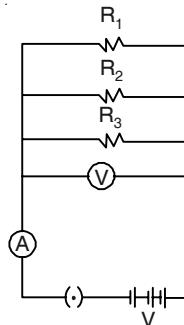
Since the arrangement is in parallel, the voltage across the circuit remains the same.

So, $I_1 = V/R_1$
                          $I_2 = V/R_2$
                          $I_3 = V/R_3$

So, $I_1 : I_2 : I_3 = i$
       $V/R_1 + V/R_2 + V/R_3 = V/R_{eq}$
            $1/R_{eq} = 1/R_1 : 1/R_2 : 1/R_3$

(b) Two 20 ohm resistors in parallel are connected to one 10 ohm resistor in series.

For resistor in parallel,

$$1/R_p = 1/20 + 1/20 = 2/20 = 1/10 \text{ ohm}$$
or $R_p = 10 \text{ ohm}$

For resistor in series,

$$R = 10 \text{ ohm} + 10 \text{ ohm} = 20 \text{ ohm}$$ **[3+2]**

30. (a)

S. No.	Biodegradable waste	Non-biodegradable waste
(i)	It decomposes naturally in the environment by the action of microbes.	It does not decompose naturally.
(ii)	It is environment friendly.	It is harmful to the environment and causes pollution.
(iii)	It can be converted into manure or recycled.	It can be either reused or recycled.
(iv)	*e.g.* waste papers, wood etc.	*e.g.* Plastic bags, plastic bottles etc.

(b) **(i)** By following 3 R's of waste management (Reduce, Reuse and Recycle).

(ii) Use separate bins for disposing non-biodegradable wastes. Such wastes should be treated properly before they are dumped in landfills.

(iii) Use biodegradable materials such as paper bags, jute bags etc. in place of non-biodegradable materials like plastic.   **[2 + 2 + 1]**

OR

Solar cell panel are devices used to absorb sun's ray and convert them into high power electricity or heat.

Materials used to make solar cell are - Gallium and Silicon.

Uses of solar panels are:

 (i) In wide range of electronic equipments.

(ii) Radio, TV relay stations in remote locations.

Limitations of solar panels:

 (i) Not available in night and on cloudy day.

(ii) Its direct utility is limited as energy reaching the surface is diffused.   **[1 + 2 + 1 + 1]**