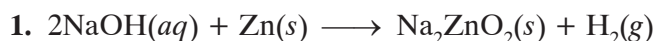


Answers to RSPL/1 (DS2)



All metals do not react with base. Only zinc reacts with sodium hydroxide to form salt as sodium zincate and hydrogen gas.

OR

Limestone, chalk, marble.

(any two)

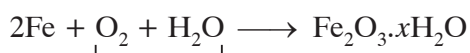
2. 'Reuse' strategy does not involve any energy expenditure, but recycling does; hence, reuse is better than recycling.

3. (a) Oxidation

(b) (ii) acid

(c) Rusting as it contains iron which gets oxidised.

Chemical equation:



From air

Rust

(d) By polishing and painting.

4. (a) (ii) 9.1 A, 0.05 A, 1.1 A

(b) (iii) Geyser

(c) Geyser because current requirement of geyser (9.1 A) is much higher than the fuse rating.

So, the fuse of 5 A rating will blow off if geyser is connected in circuit.

(d) Current requirement = $\frac{\text{Power}}{\text{Voltage}} = \frac{400 \text{ W}}{220 \text{ V}} = 1.8 \text{ A}$

5. (d)

6. (c)

7. (b)

OR

(d)

8. (c)

9. (c)

10. (d)

11. (d)

OR

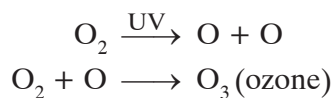
(b) Red colour has longer wavelength so least scattered by smoke or fog.

12. (a)

13. (c) Assertion is true but the Reason is false.

14. (a) Both Assertion and the Reason are correct and Reason is correct explanation of the Assertion.

15. (a) – Ozone (O₃) is a molecule formed of three atoms of oxygen.
- It is formed at higher levels of atmosphere due to the action of UV radiation on oxygen molecule.
 - The high energy of UV-radiation splits the molecular oxygen into two free atoms of oxygen.
 - These oxygen atoms combine with molecular oxygen to form ozone.



(b) It acts as a shield and protect the living beings from the harmful UV radiation.

OR

Fossil fuels must be judiciously used because:

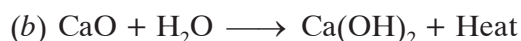
- (i) They are exhaustible resources formed by the degradation of biomass millions of years ago; they will be exhausted in the near future, even if we use them carefully.
- (ii) Burning them produces gases like SO₂, NO₂ (and CO, when burnt under insufficient oxygen) which are poisonous at high concentration and pollute the atmosphere and produce acid rain too.
- (iii) Since, they are huge reservoirs of carbon, and if all the carbon is converted into CO₂, a greenhouse gas, its high concentration in the atmosphere, will lead to global warming.

16. (a) **Differences:**

Xylem transport	Phloem transport
<ul style="list-style-type: none"> – Water and minerals are transported through xylem. – Transport is only upwards. – It is mainly due to some physical forces. 	<ul style="list-style-type: none"> – Organic food is transported through phloem. – Transport is both upwards and downwards. – It involves physiological processes and utilises energy (ATP).

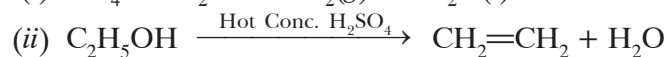
(b) Transpiration is the process in which plants lose the excess water in the form of vapour.

17. (a) Calcium oxide combines with water to form calcium hydroxide and energy in the form of heat is released.



(c) It is an exothermic reaction. It is also a combination reaction.

18. (i) $\text{CH}_4 + 2\text{O}_2 \longrightarrow \text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$



OR

(a) It is an atom or group of atoms or reactive part of compound which largely determines the chemical properties of a compound.



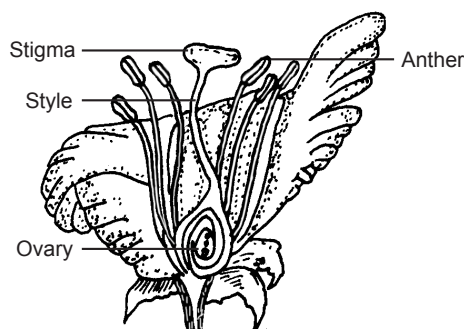
(ii) Ethanoic acid: Carboxylic acid (—COOH)

- (b) 'X' — Carbon
- 'A' — Diamond
- 'B' — Graphite
- 'C' — Fullerene

19. Advantages of synthetic detergents over soaps:

- (a) Synthetic detergents have stronger cleansing power than soaps.
- (b) Synthetic detergents can be used in the acidic medium/water whereas soaps decompose in acidic conditions.
- (c) Synthetic detergents can be used for washing even in hard water whereas soaps form precipitate in hard water and lose their property.

20. (a)



Longitudinal section of a flower

(b)	Asexual reproduction	Sexual reproduction
	<ul style="list-style-type: none"> – It involves a single parent. – There is no formation or fusion of gametes. – Individuals formed are genetically identical among themselves and to the parent. 	<ul style="list-style-type: none"> – It involves two parents. – There is formation and fusion of gametes. – Individuals formed are genetically different among themselves and to the parent.

(any two)

21. (a) Respiratory organs of Terrestrial Organisms:

- (i) They have a large surface area for exchange of gases.
- (ii) The surface is very fine and delicate.
- (iii) This is protected and placed within the body of the organism.
- (iv) There is a mechanism to move the air in and out of this area.

(any three)

(b) (i) Pulmonary veins. (ii) Right atrium.

22. All the electrical gadgets are connected in parallel in the circuit because of the following reasons:

- (a) Each circuit will have the same potential difference which is equal to the potential difference in the supply line. As a result, each electrical appliance will work under constant voltage.
- (b) When two or more appliances are used at the same time, each appliance will be able to draw current as needed. The appliances having low resistances will draw higher current, and those having high resistances will draw smaller current.

- (c) When distribution circuits are in parallel, then each circuit operates separately. So, if one of the distribution circuits gets overloaded, only the fuse in that circuit will be blown off. Other distribution lines will remain unaffected.

OR

For parallel combination

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \quad \dots(i)$$

By Ohm's law,

$$V = IR$$

$$\Rightarrow \frac{1}{R} = \frac{I}{V}$$

Putting in equation (i)

As current divides in parallel combination,

$$\frac{I}{V} = \frac{I_1}{V} + \frac{I_2}{V} + \frac{I_3}{V}$$

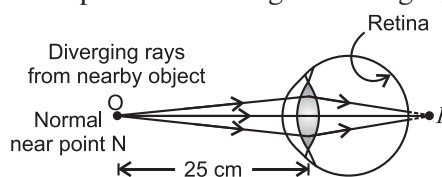
$$\frac{1}{V}(I) = \frac{I}{V}(I_1 + I_2 + I_3)$$

Thus,

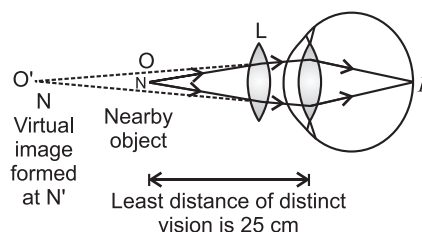
$$\boxed{I = I_1 + I_2 + I_3}$$

23. (a) CNG because it contains highest percentage of hydrogen in its molecule called methane (CH_4).
- (b) Natural gas is considered as a clean fuel due to the following reasons:
- (i) It burns with smoke-free blue flame.
 - (ii) It produces only CO_2 and water on burning which do not cause any harm to the environment.
 - (iii) It leaves no ash after burning.

24. (a) Diagram showing eye of a person suffering from long-sightedness.



- (b) Diagram showing corrected eye from long-sightedness.



25. (a) (i) The face of the loop will behave as North pole.
(ii) End B will behave as a North pole.
- (b) A magnet that retains its magnetic properties in the absence of an inducing current or field is called **permanent magnet**. Permanent magnets have constant magnetic field around it. When a soft iron is placed inside a solenoid and current is passed, it gets magnetised. The magnet so formed is called an **electromagnet**.

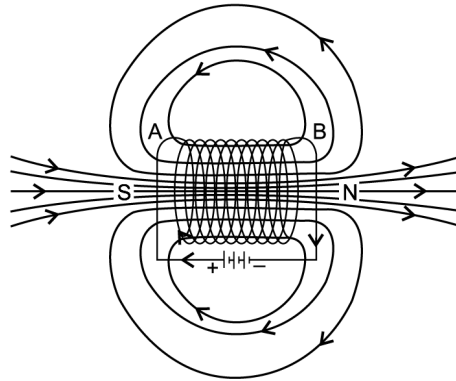
Uses:

Permanent magnet is used in (i) Electric generators and (ii) loud speakers.

Electromagnet is used in (i) Cranes and (ii) Electric bells.

OR

- (a) Solenoid
(b) Uniform magnetic field.
(c)



- (d) (i) Magnitude of current flowing through it.
(ii) Number of turns of a circular coil.
- (e) It becomes an electromagnet.
26. (a) (i) Radius of curvature $R = 2.0$ m, $u = 3.5$ m

Using mirror formula, $\frac{2}{R} = \frac{1}{v} + \frac{1}{u}$

$$\frac{2}{2.0 \text{ m}} = \frac{1}{v} + \left(\frac{1}{(-3.5 \text{ m})} \right)$$

$$\frac{1}{v} = \frac{2}{2.0 \text{ m}} + \frac{1}{3.5 \text{ m}}$$

$$v = 0.78 \text{ m}$$

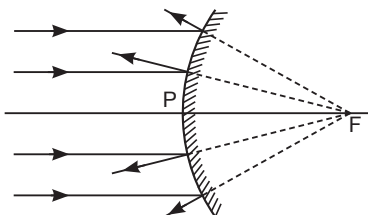
The image is at a distance of 0.78 m behind the mirror.

(ii) Magnification = $\frac{-v}{u} = \frac{-0.78 \text{ m}}{-3.5 \text{ m}} = 0.22$

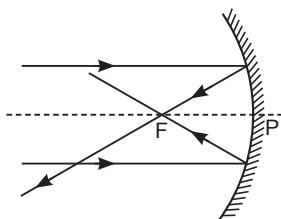
Image is 22% of the size of the object.

- (iii) The image is virtual and erect.

- (b) (i) Diagram showing reflection of a beam of light coming from a far-off object by a convex mirror.



- (ii) Diagram showing reflection of a beam of light coming from a far-off object by a concave mirror.



27. (a) $2\text{CH}_3\text{CH}_2\text{ONa} + \text{H}_2$ (b) $2\text{CO}_2 + 3\text{H}_2\text{O} + \text{Heat}$
 (c) CH_3COOH (d) CH_3CH_3
 (e) $\text{CH}_3\text{COOCH}_2\text{CH}_3 + \text{H}_2\text{O}$
28. (a) Carbon, C (b) Phosphorus, P
 (c) Argon, Ar (d) Zinc, Zn
 (e) Sodium, Na

OR

- (a) Helium, He (b) Silicon, Si
 (c) Lithium, Li (d) Magnesium, Mg
 (e) Fluorine, F
29. (a) Fats are digested in the small intestine of our alimentary canal.

Fat digestion:

- Bile salts breakdown the large globules of fat into smaller globules, in the process, called emulsification.
- The lipases of the pancreatic juice break down the emulsified fats.
- The lipases of the intestinal juice complete the digestion of fats.
- The end products of fat digestion are fatty acids and glycerol.

(b) **Functions of Lymph**

- It transports the digested fats absorbed from the intestine to blood for circulation.
- It drains the excess tissue fluid back into the blood.

30. (a) Placenta

- It is the special tissue that helps in the nutrition of the embryo from the mother’s blood.

Structure

- It is a disc-like tissue embedded in the uterine wall.
- It contains villi on the embryo’s side of the tissue and the villi are surrounded by blood spaces on the mother’s side; this provides a large surface area for exchange of materials between the mother’s blood and the foetus.

Functions

- It provides nutrients and oxygen to the foetus.
- It also removes the metabolic wastes developed by the foetus by transferring them to mother’s blood.

- (b) – The oral pills contain certain hormones (drugs); they prevent the release of egg and thereby fertilisation.

- Since, they change the hormonal balance of the body, they cause side-effects.

OR

- (a) – When the inheritance of two traits is considered, they are inherited independently of each other.

- When a cross is made between a tall pea plant with round seeds and a short pea plant with wrinkled seeds, the F_1 progeny plants are all tall with round seeds.

- When the F_1 plants are allowed to self-pollinate and reproduce, the F_2 progeny consisted of some tall plants with round seeds and some dwarf plants with wrinkled seeds; these are the parental traits.

- There were also some new combinations of the traits, *i.e.* some tall plants with wrinkled seeds and some dwarf plants with round seeds.

- So, it is clear that the height of the plant (tall and dwarf) and the seed shape (round and wrinkled) characters have been inherited independently of each other.

(b)	Homologous organs	Analogous organs
	– These are the organs in different groups of organisms, which have a similar basic structure, but perform different functions. e.g. wings of birds and human hands.	– These are the organs in different groups of organisms, which have a similar appearance and function, but are different in their basic structure and origin. e.g. wings of birds and wings of insects.