# CBSE Sample Question Paper Term 1

## Class – X (Session : 2021 - 22)

## SUBJECT - SCIENCE - 086 - TEST - 05

### Class 10 - Science

**Time Allowed: 1 hour and 30 minutes** **Maximum Marks: 40**

**General Instructions:**

1. The Question Paper contains three sections.
2. Section A has 24 questions. Attempt any 20 questions.
3. Section B has 24 questions. Attempt any 20 questions.
4. Section C has 12 questions. Attempt any 10 questions.
5. All questions carry equal marks.
6. There is no negative marking.

**Section A**

**Attempt any 20 questions**

1. Choose a displacement reaction: **[0.8]**

   a) Burning of metals

   b) Addition of more active metal to a solution of a less active metal compound.

   c) Extraction of metals

   d) Electrolysis

2. Before setting up an experiment to show that seeds release carbon dioxide during respiration, the seeds should be **[0.8]**

   a) boiled to make them soft

   b) kept moist till they germinate

   c) soaked in vinegar

   d) dried completely

3. Pick out a decomposition reaction: **[0.8]**

   a) $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$

   b) $C_2H_4 + H_2 \rightarrow C_2H_6$

   c) $Cu + AgNO_3 \rightarrow Cu\ (NO_3)_2 + 2Ag$

   d) $NH_4Cl \rightarrow NH_3 + HCl$

4. Magnification produced by a rear view mirror fitted in vehicles **[0.8]**

   a) is equal to one

   b) can be more than or less than one depending upon the position of the object in front of it

   c) is less than one

   d) is more than one

5. In the experiment to prove that light is necessary for photosynthesis, which one of the following is not required? **[0.8]**

   a) Water

   b) KOH

c) Iodine
d) Alcohol

6. A student has to do the experiment on finding the focal length of a given convex lens by using a distant object. She can do her experiment if she is also made available with **[0.8]**

a) a lamp and a screen
b) a scale and a screen
c) a lamp and a scale
d) None of these

7. Bees are sensitive to: **[0.8]**

a) Infrared light
b) All of these
c) ultraviolet red
d) White light

8. Which is the first step of photosynthesis? **[0.8]**

a) Formation of ATP
b) Excitation of electron of chlorophyll
c) Ionization of water
d) Attachment of $CO_2$ to 5 - carbon sugar

9. The clear sky appears blue because **[0.8]**

a) Violet and blue lights get scattered more than lights of all other colours by the atmosphere.
b) Blue light gets absorbed in the atmosphere.
c) Light of all other colours is scattered more than the violet and blue colour lights by the atmosphere.
d) Ultraviolet radiations are absorbed in the atmosphere.

10. Which of the following is used for dissolution of gold? **[0.8]**

a) Aqua regia
b) Sulphuric acid
c) Hydrochloric acid
d) Nitric acid

11. During contraction of heart, what prevents back flow of blood? **[0.8]**

a) Valves in heart
b) Thin walls of atria
c) Thick muscular walls of ventricles
d) All of the these

12. $HNO_3$ is a strong acid because: **[0.8]**

a) None of these
b) It doesn't dissociate into ions at all
c) It dissociates partially in aqueous solution
d) It dissociates completely in aqueous solution

13. Which of the following phenomena contributes significantly to the reddish appearance of the sun at sunrise or sunset? **[0.8]**

a) Scattering of light
b) Total internal reflection of light
c) Dispersion of light
d) Reflection of light from the earth

14. How does a gaseous exchange take place in woody plants? **[0.8]**

a) Epidermal cells
b) Stem hair
c) Lenticels
d) Root hair

15. Which of the following can make a parallel beam of light when light from a point source is incident on it? **[0.8]**

a) Convex mirror as well as concave lens
b) Two plane mirrors placed at 90° to each other
c) Concave mirror as well as convex lens
d) Concave mirror as well as concave lens

16. $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$ **[0.8]**

The above reaction is an example of a

a) displacement reaction
b) double displacement reaction
c) combination reaction
d) decomposition reaction

17. When the two opposite surfaces of the slab are not parallel, the emergent angle **e** and incident angle are related as **[0.8]**

a) e < i
b) e > i
c) does not depend on the refractive index of the medium
d) depends on the refractive index of the medium

18. Twinkling of stars is due to atmospheric **[0.8]**

a) dispersion of light by water droplets
b) internal reflection of light by clouds
c) refraction of light by different layers of varying refractive indexes
d) scattering of light by dust particles

19. Match the following with correct response. **[0.8]**

| | |
|---|---|
| (a) Prism | (i) A medium bounded by two plane refracting surfaces at an angle |
| (b) Spectrum | (ii) Scattering of beam of light, when it passes through colloidal solution |
| (c)Tyndall effect | (iii) Splitting up of white light into its components |
| (d) Rainbow | (iv) It is a spectrum of white light when it passes through small rain drops |

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

20. What is the mode of nutrition seen in Amoeba? **[0.8]**

a) Parasitic
b) Holozoic
c) Saprotrophic
d) Autotrophic

21. Washing soda is a **[0.8]**

a) acidic salt
b) neutralized salt
c) amphoteric salt
d) basic salt

22. The final product of glycolsis is **[0.8]**

a) Glucose
b) Acetyl COA
c) Malic acid
d) Pyruvic acid

23. A ray passing through the centre of curvature of a concave mirror is inclined at an angle **α** to its principal axis. The angle of reflection for this ray equals: **[0.8]**

a) $\left(\frac{\alpha}{2}\right)^{\circ}$ b) $0^{o}$

c) $\alpha^{\circ}$ d) $90^{o}$

24. When a light passes through a prism, it splits into its component colours. This phenomenon is called. **[0.8]**

a) Reflection b) Spectrum

c) Dispersion d) Refraction

**Section B**

**Attempt any 20 questions**

25. An aqueous solution turns red litmus solution blue. Excess addition of which of the following solution would reverse the change? **[0.8]**

a) Baking powder b) Ammonium hydroxide solution

c) Hydrochloric acid d) Lime

26. Which one of the following types of medicines is used for treating indigestion? **[0.8]**

a) Antacid b) Antiseptic

c) Antibiotics d) Analgesic

27. The critical angle for diamond is **[0.8]**

a) $93^{o}$ b) $180^{o}$

c) $50^{o}$ d) $24^{o}$

28. The ratio of HCl and $HNO_3$ in Aqua Regia is: **[0.8]**

a) 3 : 2 b) 3 : 1

c) 1 : 3 d) 2 : 3

29. A student was given four unknown colourless samples labelled A, B, C and D and asked to test their pH using pH paper. He observed that the colour of pH paper turned to light green, dark red, light orange and dark blue with samples A, B, C and D respectively. The correct sequence of increasing order of the pH value for samples is **[0.8]**

a) C < B < A < D b) A < B < C < D

c) A < D < C < B d) B < C < A < D

30. We will observe white ppt in which of the following reaction? **[0.8]**

a) Barium chloride is mixed with hydrochloric acid

b) Barium chloride is mixed with sodium chloride solution

c) Barium chloride is mixed with sodium sulphate solution

d) Barium carbonate is mixed with sodium sulphate solution

31. **Assertion(A):** Ammonia solution is an alkali. **[0.8]**
**Reason (R):** Ammonia solution turns blue litmus paper red.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

32. **Assertion (A):** Gas bubbles are observed when sodium carbonate is added to dilute hydrochloric acid. **[0.8]**
**Reason (R):** Carbon dioxide is given off in the reaction.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

33. **Assertion (A):** Excretion is the biological process by which harmful wastes are removed from an organism's body. **[0.8]**
**Reason (R):** The mode of excretion is completely the same in both unicellular and multicellular organisms.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

34. **Assertion (A):** Refractive index of glass with respect to air is different for red light and violet light. **[0.8]**
**Reason (R):** Refractive index of a pair of media depends on the wavelength of light used.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

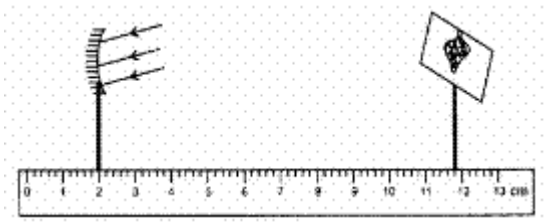
35. **Assertion (A):** In the case of a rainbow, a light at the inner surface of the water drop gets internally reflected. **[0.8]**
**Reason (R):** The angle between the refracted ray and normal to the drop surface is greater than the critical angle.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

36. Which of the following are present in a dilute aqueous solution of hydrochloric acid? **[0.8]**

a) Unionised HCI
b) Cl + OH
c) $H_3O^+ + Cl^-$
d) $H_3O^+ + OH$

37. In the set-up shown below, a clear image of a distant object is obtained on the screen. The focal length of the concave mirror is: **[0.8]**



a) 9.4 cm

b) 9.9 cm

c) 9.8 cm

d) 11.4 cm

38. Which is the first enzyme to mix with food in the digestive tract? **[0.8]**

a) Cellulase

b) Pepsin

c) Trypsin

d) Amylase

39. Find the focal length of a convex mirror of radius of curvature 1 m. **[0.8]**

a) 0.25 m

b) None of these

c) 0.5 m

d) 1 m

40. As the pH value of solution increases from 7 to 14 , it represents **[0.8]**

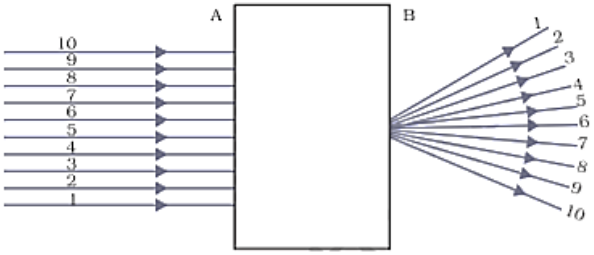
a) a decrease on the concentration of $OH^-$ ions

b) an increase in the concentration in $OH^-$ ion

c) no change in the concentration of $OH^-$ ions

d) an increase in the concentration of $H_3O^+$ ions.

41. A beam of light is incident through the holes on side A and emerges out of the holes on the other face of the box as shown in the Figure. Which of the following could be inside the box? **[0.8]**



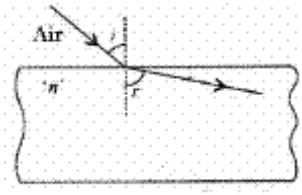

a) Prism

b) Concave lens

c) Convex lens

d) Rectangular glass slab

42. The value of n for the incident ray through air medium is: **[0.8]**




a) > 3

b) < 1

c) = 1

d) > 1

43. A few drops of iodine solution were added to rice water. The solution turned blue-black in colour. This indicates that rice water contains **[0.8]**

a) Simple proteins

b) Fats

c) Starch

d) Complex proteins

44. A ray passing through the focus and falling on a convex lens will: **[0.8]**

a) retrace its path

b) will emerge parallel to the principal axis

c) will emerge through a focus on another side

d) will emerge perpendicular to the principal axis

45. Name a plant that does not have a transport system. **[0.8]**

a) Banana tree

b) Mango tree

c) Chlamydomonas

d) Banyan tree

46. The image of a distant object is obtained on a screen by using a concave mirror. The focal length of the mirror can be determined by measuring the distance between **[0.8]**

a) the mirror and the screen

b) the object and the screen

c) the object and the mirror

d) None of these

47. The bluish colour of water in deep sea is due to **[0.8]**

a) absorption of light by the sea

b) scattering of light

c) reflection of sky in water

d) the presence of algae and other plants found in water

48. Dried fruit plastic bags sold in the market are filled with: **[0.8]**

a) Hydrogen gas

b) All of these

c) Helium gas

d) Nitrogen gas

## Section C

### Attempt any 10 questions

**Question No. 49 to 52 are based on the given text. Read the text carefully and answer the questions:**

When a more reactive element displaces a less reactive element from its compound, it is called a displacement reaction. The reaction is of two types. Single displacement reaction and double displacement reaction.

Iron being more reactive than copper displaces copper from an aqueous solution of copper sulphate. This is an example of a single displacement reaction.

On adding silver nitrate solution to sodium bromide, a yellow ppt of silver bromide and solution of sodium nitrate is formed. This is an example of a double displacement reaction.

49. When Dil. sulphuric acid is added to pieces of iron sulphide, hydrogen sulphide gas is produced and soluble ferrous sulphate is formed. The type of chemical reaction involved is: **[0.8]**

a) double displacement reaction

b) combination reaction

c) decomposition reaction

d) displacement reaction

50. Following reaction is used for the preparation of oxygen gas in the laboratory **[0.8]**

$2KClO_3 \xrightarrow[Catalyst]{Heat} 2KCl\ (s) + 3O_2\ (g)$

Which of the following statement is correct?

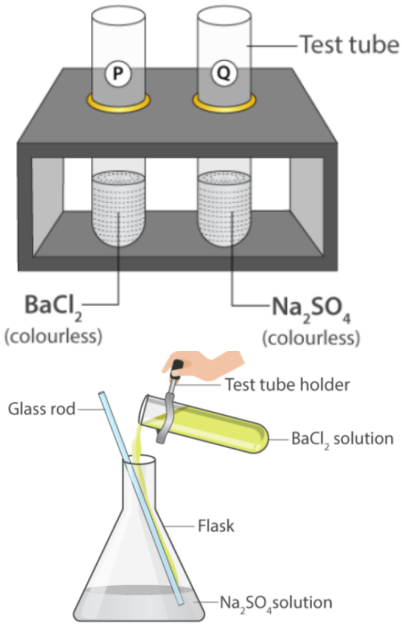
a) It is a decomposition reaction and endothermic in nature

b) It is a combination reaction

c) It is a decomposition reaction accompanied by the release of heat

d) It is a photochemical reaction and exothermic in nature.

51. What are the products formed in the double displacement reaction discussed below? **[0.8]**




a) Barium Nitrate, Sodium Chloride

b) Barium Sulphate, Sodium Chloride

c) Barium Sulphate, Sodium Hydroxide

d) Barium Chloride, Sodium sulphate

52. Which of the following elements displaces aluminium from its salt? **[0.8]**

a) Ni

b) Ca

c) Fe

d) Zn

**Question No. 53 to 56 are based on the given text. Read the text carefully and answer the questions:**

Sanjay studied about blood circulation in humans. He wanted to observe the flow of blood and was about to cut his finger a bit. He suddenly realized that this could be fatal.

53. What is the correct route for blood flow in a human? **[0.8]**

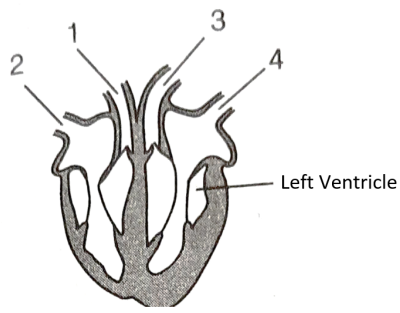
a) left auricle → left ventricle → right ventricle → right auricle → lungs

b) left auricle → left ventricle → lungs → right ventricle → right auricle

c) right auricle → right ventricle → lungs → left auricle → left ventricle

d) right auricle → right ventricle → left ventricle → left auricle → lungs

54. The diagram shows the vertical section through the heart: **[0.8]**




What are the functions of the numbered blood vessels?

a) carries blood to body-1, carries blood to lungs-2, carries blood from lungs-3, carries blood from body-4

b) carries blood to body-2, carries blood to lungs-4, carries blood from lungs-3, carries blood from body-1

c) carries blood to body-3, carries blood to lungs-1, carries blood from lungs-4, carries blood from body-2

d) carries blood to body-1, carries blood to lungs-3, carries blood from lungs-4, carries blood from body-2

55. The table shows the characteristics of blood in one blood vessel of the body. **[0.8]**

| oxygen concentration | carbon dioxide concentration | pressure |
|---|---|---|
| high | low | high |

Which blood vessel contains blood with these characteristics?

a) Pulmonary vein

b) Vena cava

c) Aorta

d) Pulmonary artery

56. The colour of blood is red due to the presence of **[0.8]**

a) Haemoglobin

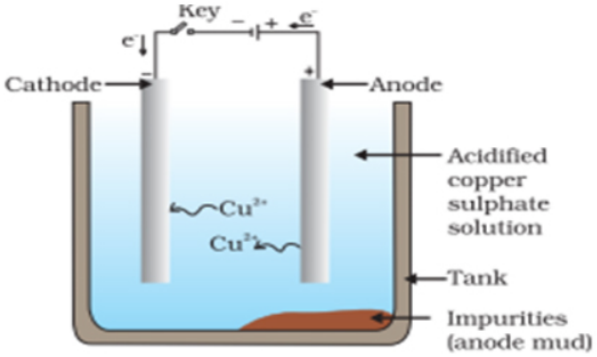
b) Xanthophyll

c) Hemocyanin

d) Chlorophyll

**Question No. 57 to 60 are based on the given text. Read the text carefully and answer the questions:**

n the electrolytic refining of copper. The electrolyte is a solution of acidified copper sulphate. There are an anode and cathode. Refining is carried out by passing an electric current.




57. The anode is _____. **[0.8]**

a) refined copper

b) impure copper

c) pure strips

d) none of these

58. Anode mud consists of: **[0.8]**

a) pure metal

b) insoluble impurities

c) soluble impurities

d) impure metal

59. Which of the following are refined electrolytically: (A) Au, (B) Cu, (C) Zn, (D) K **[0.8]**

a) B and C

b) B, C and D

c) A, B and C

d) A and B

60. On passing, electric current Cu is deposited on: **[0.8]**

a) bottom of anode

b) cathode

c) bottom of cathode

d) anode

## Solution

## SUBJECT - SCIENCE - 086 - TEST - 05

## Class 10 - Science

### Section A

1. **(b)** Addition of more active metal to a solution of a less active metal compound.
   **Explanation:** Reactions in which atoms or ions move from one compound to others to form a new compound are known as Displacement reactions.
   A general displacement reaction can be represented using a chemical equation as follows:
   $A + BC \rightarrow AC + B$
   Displacement reaction takes place only when 'A' is more reactive than B. If 'B' is more reactive than 'A', then 'A' will not displace 'C' from 'BC' and reaction will not be taken place.
   Example: When zinc reacts with hydrochloric acid, it gives hydrogen gas and zinc chloride.
2. **(b)** kept moist till they germinate
   **Explanation:** Before setting up an experiment to show that seeds release carbon dioxide during respiration, the seeds should be kept moist till they germinate as germinating seeds produced $CO_2$ gas.
3. **(d)** $NH_4Cl \rightarrow NH_3 + HCl$
   **Explanation:** Decomposition reactions are those in which a substance splits into two or more simpler substances.
   A general decomposition reaction can be represented as $AB \rightarrow A + B$.
   $NH_4Cl$ breaks up into two simple substances. So, the given reaction is a decomposition reaction.
4. **(c)** is less than one
   **Explanation:** The convex mirror is used in the rearview mirror. The convex mirror always gives a smaller image. Hence, magnification produced by the rearview mirror is always less than 1.
5. **(b)** KOH
   **Explanation:** The leaf has to be boiled in alcohol in a water bath and to be tested with iodine for starch.
6. **(b)** a scale and a screen
   **Explanation:** Screen for image formation and scale to measure length are required.
7. **(c)** ultraviolet red
   **Explanation:** The retinal cones of bees are sensitive to ultraviolet light. Hence bees respond to ultraviolet light.
8. **(b)** Excitation of electron of chlorophyll
   **Explanation:** The first step of photosynthesis is the excitation of electrons of chlorophyll. The energy from the sun, raises an energy level in the chlorophyll molecule, causing electrons to leave the molecule and travel along the electron transport chain (ETC) in a series of oxidation and reductions.
9. **(a)** Violet and blue lights get scattered more than lights of all other colours by the atmosphere.
   **Explanation:** The clear sky is blue in color because blue light is scattered more than other colour of light by molecules of air.
10. **(a)** Aqua regia
    **Explanation:** Gold is a noble metal and does not react with even concentrated acids. Aqua regia is made by mixing nitric acid and hydrochloric acid in a 1 :3 ratio. It can dissolve even gold and platinum.
11. **(a)** Valves in heart
    **Explanation:** The heart contain two major valves - the tricuspid valve between the right atrium and the right ventricle; and the bicuspid valve, between the left atrium and the left ventricle. The valves allow the unidirectional flow of blood from the respective atrium to the ventricle, in case of contraction of the atrial chamber. However, when the ventricles are contracting, the valves close and prevent the backflow of blood into the atria from the ventricles.
12. **(d)** It dissociates completely in aqueous solution
    **Explanation:** Nitric acid is a mineral acid. It is a strong acid because it dissociates completely in aqueous

solution to form hydronium ions.

13. **(a)** Scattering of light
**Explanation:** At Sunrise or Sunset, the reddish appearance of Sun is due to the scattering of light, and since Red color has the highest wavelength and is scattered least.

14. **(c)** Lenticels
**Explanation:** A lenticel is a porous tissue consisting of cells with large intercellular spaces in the bark of woody stems and roots. These raised pores in the stem of a woody plant that allows gas exchange between the atmosphere and the internal tissues.

15. **(d)** Concave mirror as well as concave lens
**Explanation:** When point source of a light is focused to a convex or concave mirror emergent rays make a parallel beam of light.

16. **(a)** displacement reaction
**Explanation:** This is an example of displacement reaction because Fe in $Fe_2O_3$ has been displaced by Al.
Hence correct answer is displacement reaction.

17. **(d)** depends on the refractive index of the medium
**Explanation:** The refractive index affects the emergent ray. Hence, it depends on the refractive index of the medium.

18. **(c)** refraction of light by different layers of varying refractive indexes
**Explanation:** Stars twinkle due to atmospheric refraction of light by different layers of atmosphere which are having different refractive indexes.

19. **(b)** (a) - (i), (b) - (iii), (c) - (ii), (d) - (iv)
**Explanation:**
    - **Prism:** It has two triangular bases and three rectangular lateral refracting surfaces. These surfaces are inclined to each other. The angle between its two lateral faces is called 'Angle of Prism'.
    - **Visible spectrum:** The band of seven colours obtained due to the dispersion of white light is called a visible spectrum (VIBGYOR).
    - **Tyndall effect:** It is the phenomenon of scattering of light by the colloidal particles. It can be observed when sunlight passes through a canopy of a dense forest.
    - **Rainbow:** It is formed due to the dispersion and total internal reflection of sunlight by the tiny water droplet, present in the atmosphere. Water droplets act like a prism.

20. **(b)** Holozoic
**Explanation:** Nutrition in amoeba is holozoic. Thus, solid food particles are ingested which are then acted upon by enzymes and digested. Holozoic nutrition is a type of heterotrophic nutrition that is characterized by the internalization (digestion) and internal processing of liquids or solid food particles.

21. **(d)** basic salt
**Explanation:** Washing soda is a is basic salt because washing soda is an alkali salt. Alkali salts or basic salt are salts that are the product of the neutralization of a strong base and a weak acid. As it is strongly basic it is so-called basic salt.

22. **(d)** Pyruvic acid
**Explanation:** Glycolysis involves the breaking down of sugar (generally glucose, although fructose and other sugars may be used) into more manageable compounds in order to produce energy. The net end products of glycolysis are two Pyruvate, two NADH, and two ATP.

23. **(b)** $0^o$
**Explanation:** The angle of reflection for the ray passing through the centre of curvature will be $0^o$. A ray passing through the centre of curvature of a concave mirror is reflected back along the same path.

24. **(c)** Dispersion
**Explanation:** Dispersion is the phenomena of splitting of white light into its constituent seven colours (VIBGYOR) on passing through a glass prism.

**Section B**

25. **(c)** Hydrochloric acid
**Explanation:** Red litmus is turned to blue by the addition of base or alkali like sodium hydroxide and for reversing this reaction, turning blue litmus to red requires the addition of an acid like hydrochloric acid.

26. **(a)** Antacid
**Explanation:** Antacids are mild bases which are given to a person suffering from acidity as acids reacts with bases to form salt and water. The excess acid present in the stomach is neutralised by the bases present in antacids and relieve indigestion.

27. **(d)** $24^o$
**Explanation:** The critical angle for diamond is equal to $24.4^o$ (approx. $24^o$), so that once the light gets into diamond, it is very likely to be totally reflected internally. By cutting the diamond suitably, multiple internal reflections can be made to occur.
As the sine of the critical angle is equal to the reciprocal of the refractive index of that material i.e.
$\sin c = \frac{1}{\mu}$ or $c = \sin^{-1}\left(\frac{1}{\mu}\right)$
$c = \sin^{-1}\left(\frac{1}{2.42}\right)$ [refractive index of diamond = 2.42]
$c = \sin^{-1}(0.413)$
$c = 24.4^o$

28. **(b)** 3 : 1
**Explanation:** The ratio of HCl and $HNO_3$ in Aqua Regia is 3:1. Aqua regia is a yellow-orange fuming liquid, so named by alchemists because it can dissolve the noble metals - gold and platinum.

29. **(d)** B < C < A < D
**Explanation:** Violet/blue colour indicates alkaline solution, red/pink colour indicates acidic solution and green colour indicates a neutral solution. A pH of 7 is neutral. A pH less than 7 is acidic. A pH greater than 7 is basic.
Dark red had the least pH, followed by light orange, light green, and dark blue has the highest pH because it is basic.

30. **(c)** Barium chloride is mixed with sodium sulphate solution
**Explanation:** On mixing a solution of barium chloride with sodium sulphate, a white precipitate of barium sulphate is immediately formed. These reactions are ionic in nature.
$BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaCl$

31. **(c)** A is true but R is false.
**Explanation:** A is true but R is false.
Ammonia gas, which is alkaline, turn the red litmus paper blue.

32. **(a)** Both A and R are true and R is the correct explanation of A.
**Explanation:** Gas bubbles are observed when sodium carbonate is added to dilute hydrochloric acid as $CO_2$ gas is released.

33. **(c)** A is true but R is false.
**Explanation:** Excretion is the biological process by which harmful metabolic wastes are removed from the body. The mode of excretion is completely different in unicellular organisms. In unicellular organisms, waste products are diffused into surrounding water through the body surface. While, in multicellular organisms, specialised organs perform the function of excretion.

34. **(a)** Both A and R are true and R is the correct explanation of A.
**Explanation:** The Refractive index of any pair of media is inversely proportional to the wavelength of light.
Hence, $\gamma_v < \gamma_r$
$\mu_r < \mu_v$
where, $\gamma_v$ and $\gamma_r$ are the wavelengths of violet and red light. $\mu_v$ and $\mu_u$ are the refractive index of violet and red light.

35. **(a)** Both A and R are true and R is the correct explanation of A.
**Explanation:** The rainbow is formed when light at the inner surface of the water drop gets internally

reflected if the angle between the refracted ray and normal to the drop surface is greater than the critical angle.

36. **(c)** $H_3O^+ + Cl^-$

**Explanation:** Any acid produces hydrogen ion ($H^+$) which is present as hydronium ion ($H_3O$) because of combination with a water molecule.

37. **(c)** 9.8 cm
**Explanation:** f = 11.8 - 2 = 9.8 cm

38. **(d)** Amylase
**Explanation:** Amylase is secreted in the mouth and acts on the starch to convert into simpler molecules. Hence, Amylase is the first enzyme to mix with food in the digestive tract.

39. **(c)** 0.5 m
**Explanation:** focal length =?
Radius of curvature, R = 1 m (+ for convex mirrror)
As f = $\frac{R}{2}$
$\therefore$ f = $\frac{1}{2}$ = 0.5 m

40. **(b)** an increase in the concentration in $OH^-$ ion
**Explanation:** The pH scale measures how acidic or basic a substance is. The pH scale ranges from 0 to 14. A pH of 7 is neutral. A pH less than 7 is acidic. A pH greater than 7 is basic. The higher the concentration of $H^+$ ions, the lower is the pH value. The increase of pH from 7 to 14 indicates the increase in the concentration of $OH^-$ ions.

41. **(c)** Convex lens
**Explanation:** Since a convex lens can converge the light rays at a point and emerged at point B. So, the convex lens is inside the box.

42. **(b)** < 1
**Explanation:** As light enters a rarer medium from a denser medium, it will bend away from the normal.

43. **(c)** Starch
**Explanation:** Starch is made up of two components **Amylose** and **Amylopectin**. When we add iodine to starch-containing water Amylose reacts with iodine to form a blue colour complex. Here solution gives blue-black colour on adding iodine which confirms the presence of starch in the rice water.

44. **(b)** will emerge parallel to the principal axis
**Explanation:** The ray light passing through the principal focus of the convex lens will emerge as parallel to the principal axis after refraction from the convex lens.

45. **(c)** Chlamydomonas
**Explanation:** As Chlamydomonas is a genus of green algae that are unicellular (single-cell), about 10 micrometres in diameter that swims with two flagella (flagellates). They are found in stagnant water and in damp soil, in freshwater, seawater. As these are unicellular plants also known to be unicellular algae, there is no point of having any kind of transport system in their body.

46. **(a)** the mirror and the screen
**Explanation:** The distance between the mirror and the screen will give the focal length of the mirror as the mirror focuses the light on the screen.

47. **(c)** reflection of sky in water
**Explanation:** The bluish color of water in the deep sea is due to the scattering of light because blue color has the smallest wavelength than other colors and therefore, due to the scattering of water particles by Sun's radiations, the color of the water is blue in the deep sea.

48. **(d)** Nitrogen gas
**Explanation:** Nitrogen prevents the oxidation of dried fruits. It is used to prevent rancidity.

**Section C**

49. **(a)** double displacement reaction
**Explanation:** double displacement reaction

50. **(a)** It is a decomposition reaction and endothermic in nature
**Explanation:** It is a decomposition reaction and endothermic in nature

51. **(b)** Barium Sulphate, Sodium Chloride
**Explanation:** Barium Sulphate, Sodium Chloride

52. **(b)** Ca
**Explanation:** Ca

53. **(c)** right auricle $\rightarrow$ right ventricle $\rightarrow$ lungs $\rightarrow$ left auricle $\rightarrow$ left ventricle
**Explanation:** right auricle $\rightarrow$ right ventricle $\rightarrow$ lungs $\rightarrow$ left auricle $\rightarrow$ left ventricle

54. **(c)** carries blood to body-3, carries blood to lungs-1, carries blood from lungs-4, carries blood from body-2
**Explanation:** carries blood to body-3, carries blood to lungs-1, carries blood from lungs-4, carries blood from body-2

55. **(c)** Aorta
**Explanation:** Aorta

56. **(a)** Haemoglobin
**Explanation:** Haemoglobin

57. **(b)** impure copper
**Explanation:** impure copper

58. **(b)** insoluble impurities
**Explanation:** insoluble impurities

59. **(a)** B and C
**Explanation:** B and C

60. **(b)** cathode
**Explanation:** Cathode