

Series JSK/1

Set No. 4

अनुक्रमांक
Roll No.

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प्रश्न-पत्र कोड
Question Paper Code **031/1/4**

छात्र प्रश्न-पत्र कोड को OMR शीट में आबंटित जगह में लिखें।
Candidates must write the Question Paper Code in the space allotted in the OMR Sheet.

नोट / NOTE :

- (i) कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ 23 हैं।
Please check that this question paper contains 23 printed pages.
- (ii) प्रश्न-पत्र में ऊपरी दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को छात्र OMR शीट में उपयुक्त स्थान पर लिखें।
Question Paper Code given on the top right hand side of the question paper should be written in the appropriate place in the OMR Sheet by the candidate.
- (iii) कृपया जाँच कर लें कि इस प्रश्न-पत्र में 60 बहुविकल्पीय प्रश्न (MCQs) हैं।
Please check that this question paper contains 60 Multiple Choice Questions (MCQs).
- (iv) परीक्षा शुरू होने के वास्तविक समय से पहले इस प्रश्न-पत्र को पढ़ने के लिए 20 मिनट का अतिरिक्त समय आबंटित किया गया है।
20 minute additional time has been allotted to read this question paper prior to actual time of commencement of the examination.

विज्ञान (सैद्धांतिक)

SCIENCE (Theory)

Term-I

निर्धारित समय : 90 मिनट

Time allowed : 90 minutes

अधिकतम अंक : 40

Maximum Marks : 40

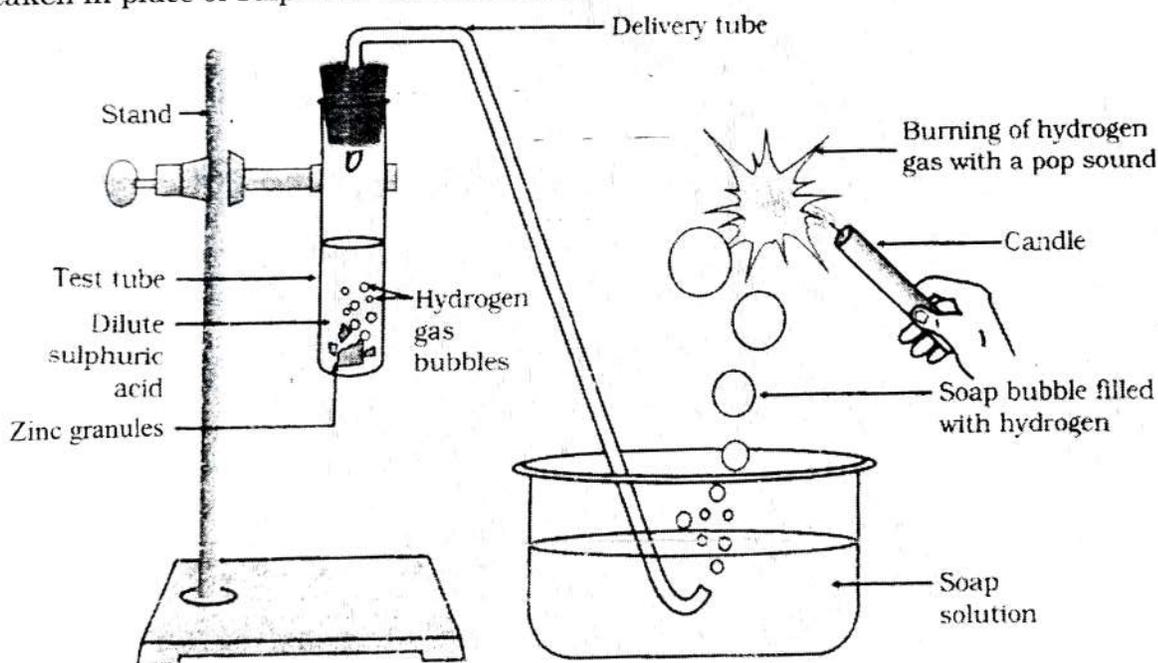
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Page 1

P.T.O.

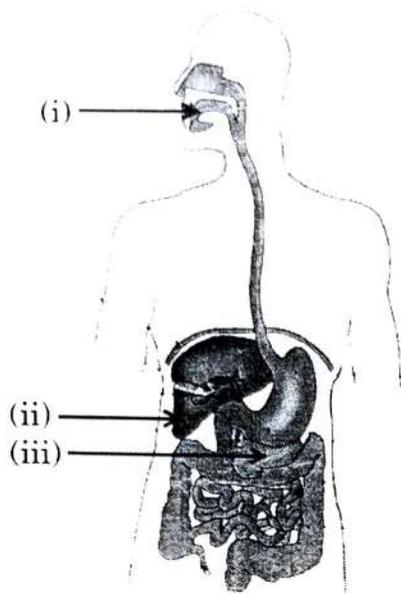
A solution gives yellowish orange colour when a few drops of universal indicator are added to it. This solution is of :

- (a) Lemon juice (b) Sodium chloride
(c) Sodium hydroxide (d) Milk of magnesia
6. Concentrated H_2SO_4 is diluted by adding drop by drop :
- (a) Water to acid with constant stirring (b) Acid to water with constant stirring
(c) Water to acid followed by a base (d) Base to acid followed by cold water
7. Absence of tartaric acid in baking powder makes the taste of the cake bitter due to the presence of :
- (a) Sodium hydrogen carbonate (b) Sodium carbonate
(c) Sodium metabisulphite (d) Sodium sulphate
8. The pH of acid rain is approximately :
- (a) 5.6 (b) 6.4 (c) 7.0 (d) 7.9
9. Salt 'A' commonly used in food products, is a reactant to produce salt 'B', used in the kitchen for making tasty, crispy pakoras. Salt 'B' on heating converts into another salt 'C', which is used in the manufacturing of glass. Salts 'A', 'B' and 'C' respectively are :
- (a) $NaHCO_3$, $NaCl$, Na_2CO_3 (b) Na_2CO_3 , $NaHCO_3$, $NaCl$
(c) Na_2CO_3 , $NaCl$, $NaHCO_3$ (d) $NaCl$, $NaHCO_3$, Na_2CO_3
10. In the following diagram, what would happen if some amount of sodium hydroxide is taken in place of sulphuric acid and the test tube is heated :



- (a) Same amount of H_2 gas is evolved
(b) H_2 gas is not evolved
(c) The amount of H_2 gas evolved is much less
(d) In place of H_2 gas, O_2 gas evolves

11. In Human Alimentary canal, the specific enzyme/juice secreted in locations (i), (ii) and (iii) are :



- (a) (i) Amylase (ii) Pepsin (iii) Bile
 (b) (i) Amylase (ii) Bile (iii) Trypsin
 (c) (i) Lipase (ii) Amylase (iii) Pepsin
 (d) (i) Trypsin (ii) Bile (iii) Amylase

12. The sequence of anaerobic respiration in our muscle cells during heavy exercise is :

- (a) Glucose $\xrightarrow{\text{Cytoplasm}}$ Pyruvate $\xrightarrow{\text{Muscle cells}}$ Lactic acid + Energy
 (b) Glucose $\xrightarrow{\text{Mitochondria}}$ Pyruvate $\xrightarrow{\text{Muscle cells}}$ Carbon dioxide + Water
 (c) Glucose $\xrightarrow{\text{Cytoplasm}}$ Pyruvate $\xrightarrow{\text{Muscle cells}}$ Ethanol + Carbon dioxide
 (d) Glucose $\xrightarrow{\text{Mitochondria}}$ Pyruvate $\xrightarrow{\text{Muscle cells}}$ Ethanol + Lactic acid

13. The separation of the right side and the left side of human heart is useful to :

- (a) Keep oxygenated blood from mixing with deoxygenated blood
 (b) Allow a slow supply of oxygen in the body
 (c) Supply energy to animals with low energy needs
 (d) Often change their body temperature

14. In spring, sugar stored in root or stem tissue of plants is transported to the buds for :

- (a) The energy needs of the buds to grow
 (b) Temperature regulation
 (c) Balancing the storage in different organs
 (d) Diffusion process

15. The energy released during cellular respiration is used to synthesize :

- (a) Ribosomes (b) RBC (c) ATP (d) Mitochondria

Upward movement of water in tall trees is due to :

- (a) Translocation (b) Excretion
(c) Photosynthesis (d) Transpiration

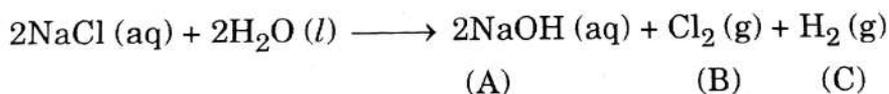
17. If a lens and a spherical mirror both have a focal length of -15 cm, then it may be concluded that :
- (a) Both are concave
(b) The lens is concave and the mirror is convex
(c) The lens is convex and the mirror is concave
(d) Both are convex
18. An optical device forms an erect image of an object placed in front of it. If the size of the image is one half that of the object, the optical device is a :
- (a) Concave mirror (b) Convex mirror
(c) Plane mirror (d) Convex lens
19. A student determines the focal length of a device 'A' by focussing the image of a far off object on a screen placed on the opposite side of the object. The device 'A' is :
- (a) Concave lens (b) Concave mirror
(c) Convex lens (d) Convex mirror
20. When light is incident on a glass slab, the incident ray, refracted ray and the emergent ray are in three media A, B and C. If n_1 , n_2 and n_3 are the refractive indices of A, B and C respectively and the emergent ray is parallel to the incident ray, which of the following is true ?
- (a) $n_1 < n_2 < n_3$ (b) $n_1 > n_2 > n_3$
(c) $n_1 < n_2 = n_3$ (d) $n_1 = n_3 < n_2$
21. The image of a candle flame formed by a lens is obtained on a screen placed on the other side of the lens. According to new cartesian sign convention, if the image is three times the size of the flame, then the lens is :
- (a) Concave and magnification is $+3$ (b) Concave and magnification is -3
(c) Convex and magnification is -3 (d) Convex and magnification is $+3$
22. The power of a combination of two lenses in contact is $+1.0$ D. If the focal length of one of the lenses of the combination is $+20.0$ cm, the focal length of the other lens would be :
- (a) -120.0 cm (b) $+80.0$ cm
(c) -25.0 cm (d) -20.0 cm

23. When a ray of light passes through a glass prism it suffers two refractions. During these refractions the ray bends :
- Away from the base in both cases
 - Towards the base in both cases
 - Towards the base in first case and away from the base in second case
 - Away from the base in first case and towards the base in second case
24. To an astronaut the sky on the moon appears dark because :
- There is no light on the moon
 - There is no atmosphere on the surface of the moon
 - Moon is a non-luminous object
 - The surface of the moon absorbs all the sunlight

SECTION B

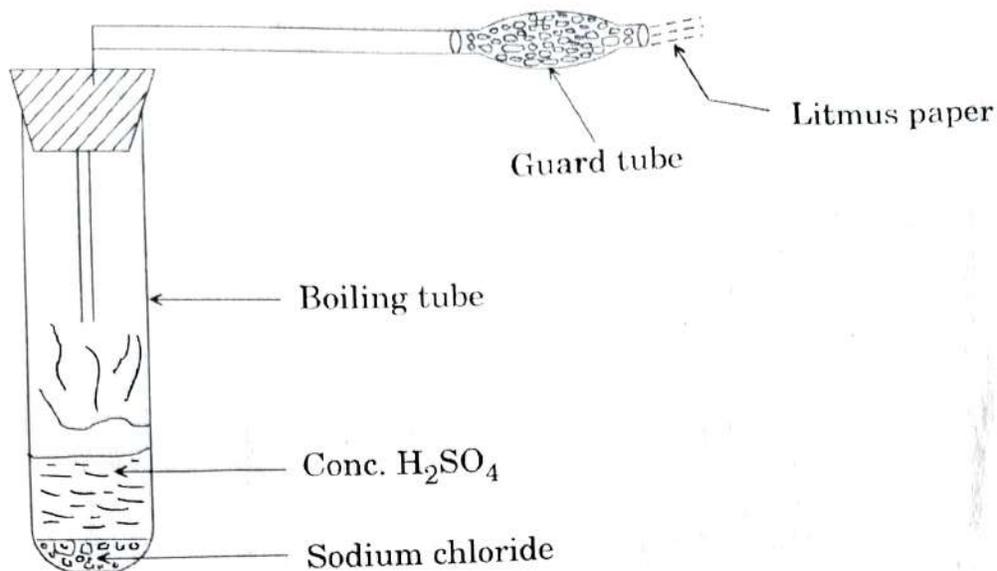
Section B consists of 24 questions. Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

25. When lead nitrate powder is heated in a boiling tube, we observe :
- Brown fumes of nitrogen dioxide
 - Brown fumes of lead oxide
 - Yellow fumes of nitrogen dioxide
 - Brown fumes of nitric oxide
26. An aqueous solution of a salt shows an orange red colour when a drop of universal indicator is added to it. This salt is made up of :
- A strong acid and a strong base
 - A weak acid and a weak base
 - A strong acid and a weak base
 - A weak acid and a strong base
27. Three test tubes A, B and C contain distilled water, an acidic solution and a basic solution respectively. When red litmus solution is used for testing these solutions, the observed colour changes respectively will be :
- A – no change; B – becomes dark red; C – becomes blue
 - A – becomes light red; B – becomes blue; C – becomes red
 - A – becomes red; B – no change; C – becomes blue
 - A – becomes light red; B – becomes dark red; C – becomes blue
28. Given below is a reaction showing Chlor-alkali process :



The products A, B and C are produced respectively :

- At the anode, at the cathode, near the cathode
- Near the cathode, at the anode, at the cathode
- At the cathode, near the cathode, at the anode
- At the anode, near the cathode, at the cathode



In the activity shown in the diagram, if the climate is humid, the role of calcium chloride taken in the guard tube is to :

- (a) Absorb the evolved gas
- (b) Warm up the gas
- (c) Dry the gas
- (d) Absorb chloride ions from the evolved gas

30. Which one of the following chemicals is used in soda acid fire extinguishers ?

- (a) Sodium chloride
- (b) Sodium acetate
- (c) Sodium hydrogen carbonate
- (d) Ammonium sulphate

Questions No. 31 to 34 consists of two statements — Assertion (A) and Reason (R). Answer these questions selecting the appropriate options given below :

- (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.

31. Assertion (A) : Silver salts are used in black and white photography.
Reason (R) : Silver salts do not decompose in the presence of light.

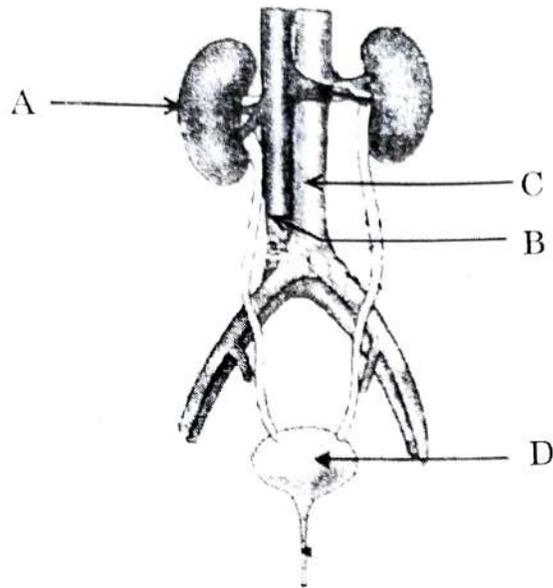
32. *Assertion (A)* : The solutions of ionic compounds are good conductors of electricity.
Reason (R) : Movement of atoms of elements take place in solution.
33. *Assertion (A)* : The rate of breathing in aquatic organisms is much slower than that seen in terrestrial organisms.
Reason (R) : The amount of oxygen dissolved in water is very low as compared to the amount of oxygen in air.
34. *Assertion (A)* : Kerosene having higher refractive index is optically denser than water, although its mass density is less than that of water.
Reason (R) : The speed of light decides whether a medium is optically rarer or optically denser. An optically denser medium may not possess greater mass density.
35. Match the metal (Column I) with its reaction with oxygen (Column II) :

<i>Column I</i>	<i>Column II</i>
A. Potassium	(i) Does not react event at high temperatures
B. Zinc	(ii) Gets coated with black-coloured layer of oxide
C. Copper	(iii) Does not burn at ordinary temperature
D. Silver	(iv) Burns vigorously
(a) A-(iv), B-(iii), C-(ii), D-(i)	
(b) -A-(iv), B-(ii), C-(i), D-(iii)	
(c) A-(iii), B-(ii), C-(i), D-(iv)	
(d) A-(iv), B-(ii), C-(iii), D-(i)	

36. Four test tubes A, B, C and D are taken. In test tube A iron nail is dipped in copper sulphate solution. In test tube B copper wire is dipped in ferrous sulphate solution. In test tube C zinc metal is dipped in ferrous sulphate solution and in test tube D iron nail is dipped in zinc sulphate solution. The reactivity order has been found to be $Zn > Fe > Cu$. In which test tubes was the colour change observed ?
- (a) A and C (b) A and B (c) B and C (d) B and D

37. The function not performed by villi is :
- (a) To increase the surface area for absorption
 (b) To ensure rich supply of blood vessels
 (c) Absorption of food
 (d) Egestion of food

In the given diagram, A, B, C and D respectively are :



- (a) A – Left kidney; B – Aorta; C – Vena cava; D – Urethra
- (b) A – Left kidney; B – Vena cava; C – Aorta; D – Urinary bladder
- (c) A – Right kidney; B – Aorta; C – Ureter; D – Urethra
- (d) A – Right kidney; B – Vena cava; C – Aorta; D – Urinary bladder

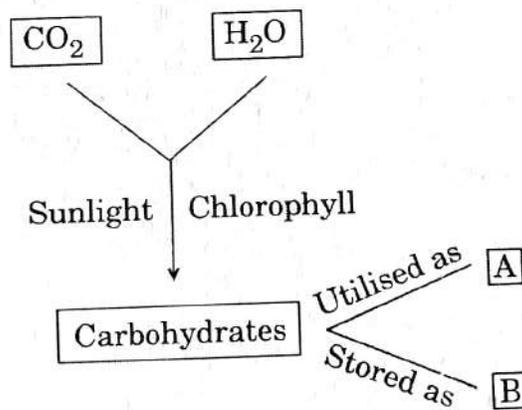
39. Thin walled blood vessels are called :

- (a) Aorta
- (b) Capillaries
- (c) Arteries
- (d) Vena cava

40. The function of the lining of mucus in the nasal passage of human beings is to :

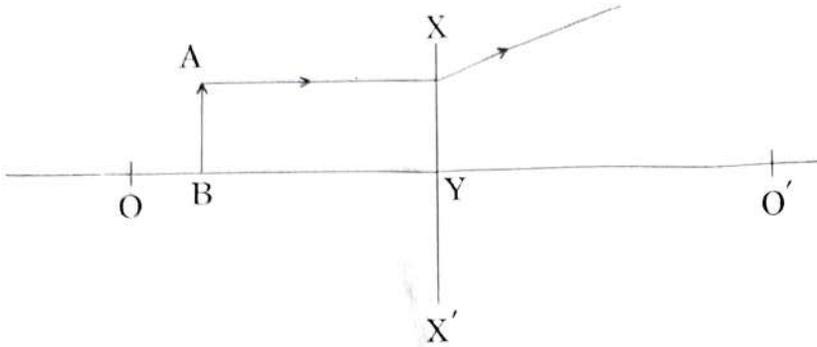
- (a) Increase the temperature of inhaled air
- (b) Move the air in and out
- (c) Filter the air that we breathe in
- (d) Absorb oxygen from the air

41. In the following flow chart showing autotrophic nutrition in green plants, A and B respectively are :



- (a) Oxygen and energy
- (b) Starch and oxygen
- (c) Energy and starch
- (d) Oxygen and water

42. Study the diagram given below and identify the type of the lens XX' and the position of the point on the principal axis OO' where the image of the object AB appears to be formed :



- (a) Concave; between O' and Y (b) Concave; between O and Y
 (c) Convex; between O' and Y (d) Convex; between O and Y

43. The image of an object placed in front of a concave mirror of focal length 15 cm is of the same size as the object. The distance between the object and its image is :

- (a) 15 cm (b) 30 cm (c) 60 cm (d) Zero

44. An object of height 3.0 cm is placed vertically on the principal axis of a convex lens. When the object distance is -37.5 cm, an image of height -2.0 cm is formed at a distance of 25.0 cm from the lens. Next, the same object is placed vertically at 25.0 cm from the lens. In this situation the image distance v and height h of the image is (according to the new Cartesian sign convention) :

- (a) $v = +37.5$ cm; $h = +4.5$ cm (b) $v = -37.5$ cm; $h = +4.5$ cm
 (c) $v = +37.5$ cm; $h = -4.5$ cm (d) $v = -37.5$ cm; $h = -4.5$ cm

45. The relation $R = 2f$ is valid :

- (a) For concave mirrors but not for convex mirrors
 (b) For convex mirrors but not for concave mirrors
 (c) Neither for concave mirrors nor for convex mirrors
 (d) For both concave and convex mirrors

46. A lens has a power of $+4.0$ D. It is :

- (a) A convex lens of focal length 4 m (b) A concave lens of focal length 4 m
 (c) A convex lens of focal length 0.25 m (d) A concave lens of focal length 0.25 m

47. An object is placed in front of a concave lens. For all positions of the object the image formed is always :

- (a) Real, diminished and inverted (b) Virtual, diminished and erect
 (c) Real, enlarged and erect (d) Virtual, erect and enlarged

48. The twinkling of star is due to :

- (a) Scattering of light (b) Dispersion of light
 (c) Tyndall effect (d) Atmospheric refraction

SECTION C

Section C consists of **three** cases followed by questions. There are a total of **12** questions in this section. Attempt any **10** questions from this section. The **first** attempted **10** questions would be evaluated.

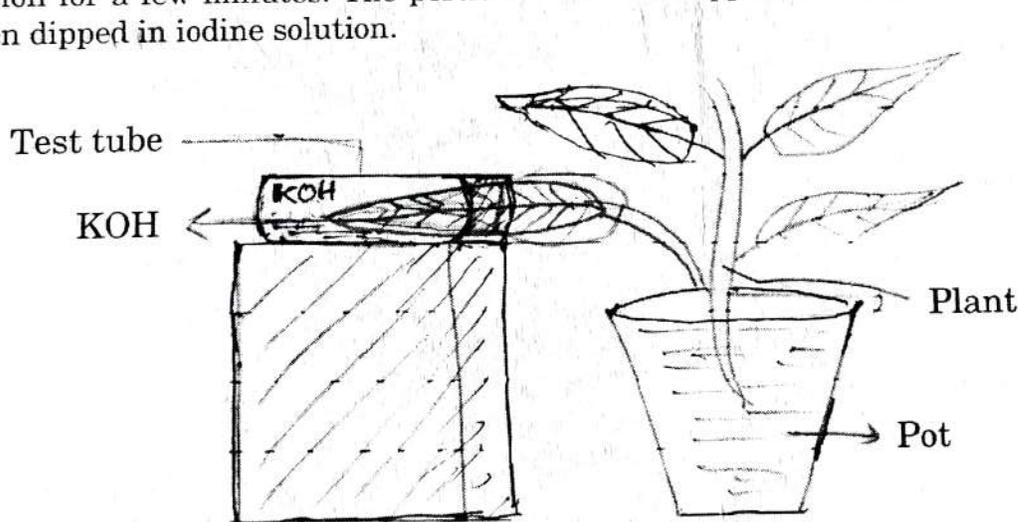
Case I

One day Kamal saw that her mother was roasting peanuts in a pan (kadahi) in the kitchen and she had taken ordinary salt to roast the peanuts. She was surprised to observe that in spite of very high temperature, the salt does not melt and the peanuts also get roasted.

49. The chemical name of common salt is :
- (a) Potassium chloride (b) Sodium carbonate
(c) Sodium hydrogen carbonate (d) Sodium chloride
50. Common salt is :
- (a) A covalent compound
(b) An ionic compound formed by sharing electrons
(c) An ionic compound formed by the transfer of electrons
(d) Soluble in organic solvents
51. Common salt is **not** a raw material for :
- (a) Bleaching powder (b) Plaster of Paris
(c) Baking soda (d) Caustic soda
52. Common salt is used as a raw material in the preparation of washing soda in which the number of molecules of water of crystallisation is :
- (a) 10 (b) 7 (c) 5 (d) 2

Case II

Activity : Take a healthy potted plant with elongated leaves. Select a leaf and insert about one half of this leaf in a test tube containing KOH and make it air tight. Place the set-up in sun for two hours. Take out the leaf from the test tube and dip it in boiling water for a few minutes. Put this leaf in a beaker with alcohol and boil it in a water bath. Wash the leaf with water and then dip the leaf in iodine solution for a few minutes. The portion of the leaf dipped in KOH solution will not show any change when dipped in iodine solution.

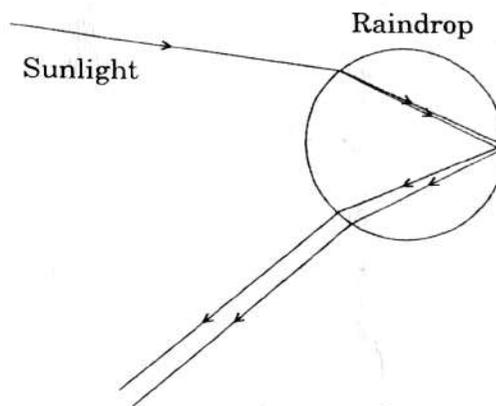


53. The function of KOH taken in the test tube is to absorb :
- (a) Released water vapours (b) Released CO_2
(c) Released O_2 (d) Chlorophyll

54. On the basis of this activity, we may conclude that the essential factor for photosynthesis is :
- (a) Carbon dioxide (b) Oxygen
(c) Chlorophyll (d) Water vapour
55. The event that does **not** occur in photosynthesis is :
- (a) Absorption of light energy by chlorophyll
(b) Reduction of carbon dioxide to carbohydrates
(c) Oxidation of carbon to carbon dioxide
(d) Conversion of light energy to chemical energy
56. Iodine solution gives blue-black colour with :
- (a) Starch (b) Proteins (c) Glucose (d) Fats

Case III

On a sunny day, Krish looked at the sky through a water fountain and was surprised to see a rainbow in the sky.



57. The location of the sun when Krish observed a rainbow was :-
- (a) Behind him (b) In front of him
(c) Overhead (d) On his left side
58. The phenomena of light involved in the formation of a rainbow are :
- (a) Reflection, refraction, dispersion
(b) Refraction, dispersion, internal reflection
(c) Refraction, dispersion, scattering
(d) Dispersion, scattering, internal reflection
59. In the formation of a rainbow, the role of water droplets present in the water fountain is to act as a :
- (a) Glass slab (b) Convex lens (c) Concave lens (d) Prism
60. While entering a water droplet the sunlight gets :
- (a) Refracted only
(b) Reflected internally
(c) Refracted and dispersed
(d) First refracted and then dispersed while coming out of the water droplet