

CBSE Sample Question Paper Term 1

Class – X (Session : 2021 - 22)

SUBJECT - SCIENCE - 086 - TEST - 04

Class 10 - Science

Time Allowed: 1 hour and 30 minutes

Maximum Marks: 40

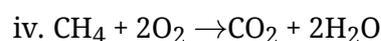
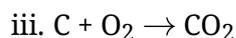
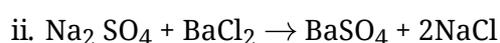
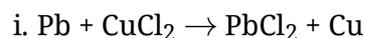
General Instructions:

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. Which among the following is(are) double displacement reaction(s)? [0.8]



a) (iii) and (iv)

b) (ii) only

c) (i) and (ii)

d) (i) and (iv)

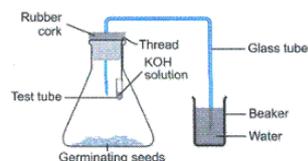
2. An experimental set-up is given below to demonstrate that CO_2 is given out during respiration. Four students made the following observations marked I, II, III and IV : [0.8]

I. Level of water remained the same in both the beaker and the delivery tube

II. Level of water increased in the delivery tube

III. Level of water gets reduced in both the beaker and the delivery tube

IV. Water ascends into the delivery tube and back flows into the beaker.



Which one of the above is the correct observation?

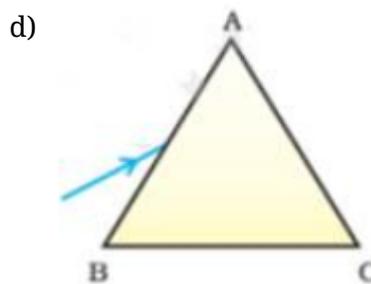
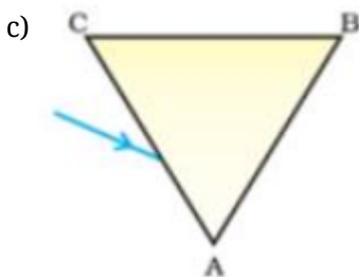
a) IV

b) III

c) II

d) I

3. Four strips labelled A, B, C and D along with their corresponding colours are shown below. [0.8]



8. A factor not affecting photosynthesis is [0.8]

- a) Carbon dioxide concentration in air b) Temperature
c) Light intensity d) Wind velocity

9. Rainbow is formed due to a combination of? [0.8]

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

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

10. Washing soda has the formula [0.8]

- a) $\text{Na}_2\text{CO}_3 \cdot 7\text{H}_2\text{O}$ b) Na_2CO_3
c) $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$ d) $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$

11. Match the following with correct response. [0.8]

Column A	Column B
(i) Epiglottis	(a) Blood coagulation
(ii) Platelets	(b) Sphygmo manometer
(iii) An instrument used to check normal activities of the heart	(c) Electro cardiograph
(iv) An instrument used to measure the blood pressure of the human heart	(d) Covers wind pipe while swallowing food

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

12. Electrical wires have a coating of an insulating material. The material, generally used is [0.8]

- a) PVC b) Sulphur
c) All can be used d) Graphite

13. 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	(iii) Splitting up of white light into its components

effect	
(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)

14. The inner lining of stomach is protected by one of the following from hydrochloric acid. Choose the correct one **[0.8]**

- a) Salivary amylase b) Pepsin
c) Mucus d) Bile

15. A student carries out the experiment of tracing the path of a ray of light through a rectangular glass slab, for two different values of angle of incidence: $\angle i = 30^\circ$ and $\angle i = 45^\circ$. The set of values of the angle of refraction ($\angle r$) and the angle of emergence ($\angle e$), she is likely to observe in the two cases, are: **[0.8]**

- a) [$\angle r = 30^\circ$, $\angle e = 20^\circ$] and [$\angle r = 25^\circ$, $\angle e = 45^\circ$] b) [$\angle r = 20^\circ$, $\angle e = 30^\circ$] and [$\angle r = 45^\circ$, $\angle e = 28^\circ$]
c) [$\angle r = 30^\circ$, $\angle e = 20^\circ$] and [$\angle r = 45^\circ$, $\angle e = 28^\circ$] d) [$\angle r = 20^\circ$, $\angle e = 30^\circ$] and [$\angle r = 25^\circ$, $\angle e = 45^\circ$]

16. A white precipitate formed by the reaction of barium chloride with sodium sulphate solution is due to **[0.8]**

- a) BaSO_3 b) BaSO_4
c) BaO d) BaS

17. Rays from Sun converge at a point 15 cm in front of a concave mirror. Where should an object be placed so that size of its image is equal to the size of the object? **[0.8]**

- a) 30 cm in front of the mirror b) between 15 cm and 30 cm in front of the mirror
c) more than 30 cm in front of the mirror d) 15 cm in front of the mirror

18. The wavelength corresponding to violet, yellow & red light are λ_v , λ_y and λ_r respectively. **[0.8]**

- a) $\lambda_v < \lambda_y < \lambda_r$ b) $\lambda_v > \lambda_y > \lambda_r$
c) $\lambda_y < \lambda_r < \lambda_v$ d) $\lambda_y < \lambda_v < \lambda_r$

19. Phenomenon responsible for the twinkling of stars **[0.8]**

- a) Atmospheric refraction b) Internal refraction
c) None of these d) Regular refraction

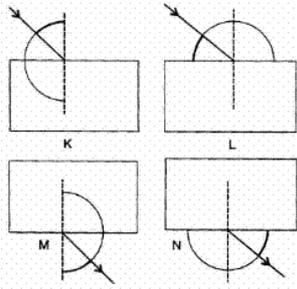
20. The filtration units of kidneys are called **[0.8]**

- a) Ureter b) Urethra
c) Neurons d) nephrons

36. Which of the following is not a mineral acid? [0.8]

- a) Nitric acid b) Sulphuric acid
 c) Hydrochloric acid d) Citric acid

37. In the experiment on tracing the path of a rays of light passing through a rectangular glass slab, the correct setting of the protractor (D), for measuring the angle of incidence ($\angle i$), and the angle of emergence ($\angle e$), corresponds, respectively, to diagrams is: [0.8]

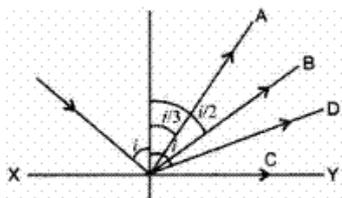


- a) L and M b) K and M
 c) K and N d) L and N

38. The kidneys in human beings are parts of the system for: [0.8]

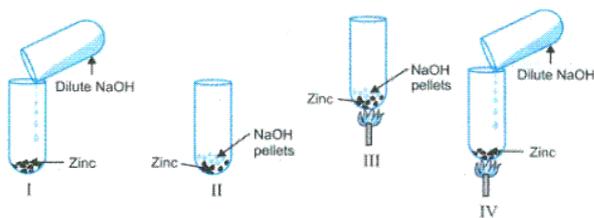
- a) respiration b) excretion
 c) nutrition d) transpiration

39. On regular reflection from the surface XY, the reflected ray will go along: [0.8]



- a) A b) D
 c) B d) C

40. The figures below show set-ups for studying the reaction of zinc with sodium hydroxide. [0.8]



The correct set-up is

- a) I b) III
 c) IV d) II

41. The nature of the image is not affected by the position of the object in [0.8]

- a) concave lenses b) none of these
 c) concave mirror d) convex mirror

42. The laws of reflection hold good for [0.8]

- a) convex mirror only b) concave mirror only

c) Au, Ag

d) Pt, Cu

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:

22 samples of toothpaste and hand washes were randomly collected from markets in Delhi and sent for research. The analysis found one of the soap samples and 4 toothpaste samples contained the chemical beyond the permissible limit of 3000ppm. It is a disturbing trend that we find triclosan in such high concentration which has long term effects on the health of children

49. Identify the toxic chemical found in toothpaste. [0.8]

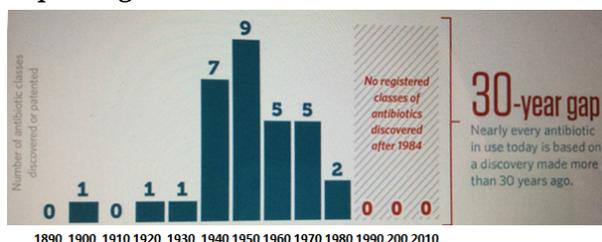
a) Triclosan

b) Sodium Fluoride

c) Glycerol

d) Sorbitol

50. Which year shows the maximum number of antibiotics discovered to keep pace with new superbugs? [0.8]



a) 1890

b) 1950

c) 1920

d) 2000

51. Why toothpaste is used for cleaning teeth? [0.8]

a) It is neutral in nature

b) It is acidic in nature

c) It is basic in nature

d) None of these

52. What is the chemical composition of tooth enamel? [0.8]

a) Zinc phosphate

b) Magnesium carbonate

c) Calcium phosphate

d) Calcium nitrate

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

In human beings, the process of intake of essential nutrients in the form of food takes place through an entire system known as the digestive system. The human digestive system constitutes a long tubular structure called the alimentary canal and various digestive glands associated with it. These glands secrete different digestive enzymes.

53. Only two of the following statements accurately describes what happens in the mouth. [0.8]

A. Amylase breaks down large starch molecules into smaller maltose molecules.

B. Chewing increases the surface area of food for digestion.

C. Saliva emulsifies fat into smaller droplets.

D. Teeth break large insoluble molecules into smaller soluble molecules.

Which statements are correct?

a) A and B

b) C and D

c) B and C

d) A and D

54. The gall bladder of a patient is removed because of gall bladder stones. Which kind of nutrient in the diet should be avoided? [0.8]

a) Fats

b) Carbohydrates

c) Proteins

d) Vitamins and minerals

55. In which order do these events occur in human nutrition? [0.8]

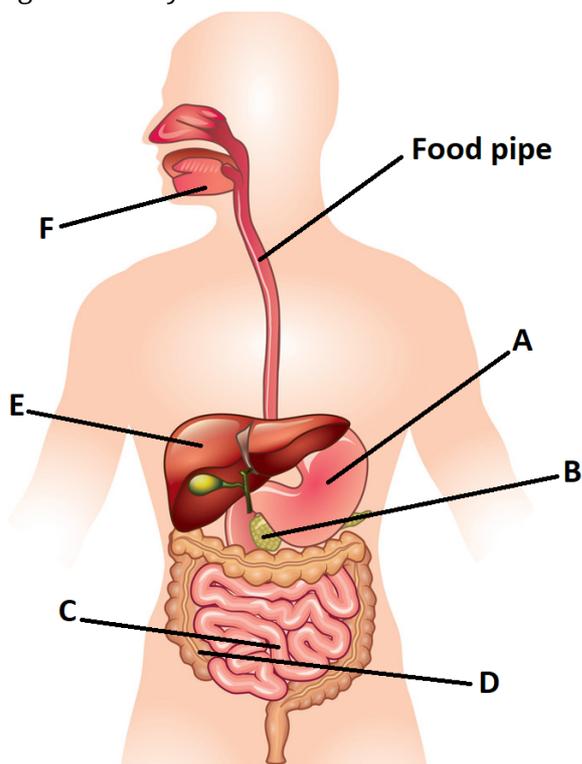
a) Digestion → Ingestion →
Assimilation → Absorption

b) Digestion → Ingestion → Absorption
→ Assimilation

c) Ingestion → Digestion → Absorption
→ Assimilation

d) Ingestion → Absorption →
Assimilation → Digestion

56. The diagram shows the human digestive system. Identify the structures which secrete digestive enzymes. [0.8]



a) A, B, C, and D

b) A, B, C, and F

c) A, C, and E

d) B, C, and D

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

Non-metals are either solids or gases. Non-metal can exist in different forms such as carbon. Each form is called allotrope. Alkali metal is so soft that it can be cut with a knife. They have low density and low melting point. Some metal can melt if they are kept in the palm.

57. Which of the following non-metal is liquid? [0.8]

a) Oxygen

b) Iodine

c) Hydrogen

d) Bromine

58. An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be: **[0.8]**

a) calcium

b) silicon

c) carbon

d) iron

59. Which of the following pair of reactants can undergo a displacement reaction under appropriate condition? **[0.8]**

a) $\text{ZnSO}_4 + \text{Fe}$

b) $\text{MgSO}_4 + \text{Pb}$

c) $\text{MgSO}_4 + \text{Fe}$

d) $\text{CuSO}_4 + \text{Fe}$

60. Which of the following is the allotrope of carbon? **[0.8]**

a) Diamond

b) Graphite

c) None of these

d) Both Diamond and Graphite

Solution

SUBJECT - SCIENCE - 086 - TEST - 04

Class 10 - Science

Section A

1. (b) (ii) only

Explanation: Double displacement reactions are those in which ions of the reactants are exchanged to form new compounds as products.

Here Sodium and Barium are displaced from each other's salts hence it is a double displacement reaction.

2. (c) II

Explanation: Seeds release CO_2 during respiration. KOH absorbs CO_2 in flask, creates a vacuum and causes rise in water level in the delivery tube.

3. (d) D

Explanation: Aluminum is a silvery-white, ductile metallic element, the most abundant in the earth's crust but found only in combination, chiefly in bauxite. Having good conductive and thermal properties, it is used to form many hard, light, corrosion-resistant alloys.

4. (b) IV

Explanation: All parallel beams are to pass through the focus.

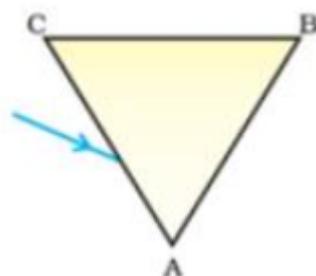
5. (d) All of these

Explanation: A beaker, a thermometer, a filter paper, a weighing balance these are the materials required for the experiment.

6. (b) C

Explanation: C has got $\angle e = \angle i$ and $\angle r < \angle i$ as these are to be satisfied for refraction in a glass slab.

7. (c)



Explanation: When the prism is inverted, then after dispersion the colors which will be observed are VIBGYOR. So, the figure is the correct image to get the third color as the color of the sky i.e. Blue.

8. (d) Wind velocity

Explanation: Wind velocity doesn't affect the photosynthesis. Unlike light intensity, CO_2 concentration, and temperature which are the major factors influencing the rate of photosynthesis, the wind has no effect on the reactions and the rate of reactions going in the chloroplast of the leaves of the plant.

9. (c) C and D

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

10. (d) $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$

Explanation: Washing soda is sodium carbonate which in this form is also known as soda ash. It is called sodium carbonate decahydrate. The formula is $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$.

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

Explanation:

- The epiglottis is a flap made of elastic cartilage covered with a mucous membrane. It opens during breathing, allowing air into the larynx. During swallowing, it closes to prevent aspiration, forcing the swallowed liquids or food to go down the esophagus instead. It is thus the valve that diverts passage to either the trachea or the esophagus.
- Platelets are the cells that circulate within our blood and bind together when they recognize damaged blood vessels. When you get a cut, for example, the platelets bind to the site of the damaged vessel, thereby causing a blood clot.
- Electrocardiograph (Cardiograph) is an instrument used in the detection and diagnosis of heart abnormalities that measures electrical potentials on the body surface and generates a record of the electrical currents associated with heart muscle activity.
- A sphygmomanometer, also known as a blood pressure meter, blood pressure monitor, or blood pressure gauge, is a device used to measure blood pressure, composed of an inflatable cuff to collapse and then release the artery under the cuff in a controlled manner, and a mercury or mechanical manometer to measure the pressure.

12. (a) PVC

Explanation: An insulating substance is required to coat the electrical wire such as PVC as it does not allow an electric current to pass through it.

13. (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.

14. (c) Mucus

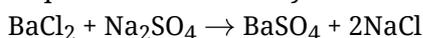
Explanation: A layer of mucus along the inner walls of the stomach is vital to protect the cell linings of that organ from the highly acidic environment within it.

15. (d) [$\angle r = 20^\circ$, $\angle e = 30^\circ$] and [$\angle r = 25^\circ$, $\angle e = 45^\circ$]

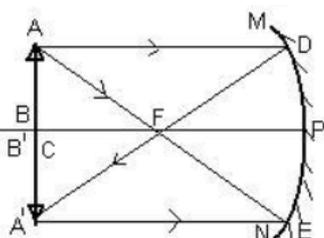
Explanation: $\angle r < \angle i$ and $\angle e = \angle i$ should be satisfied as the light from the air passes through a glass slab.

16. (b) BaSO_4

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.



17. (a) 30 cm in front of the mirror



Explanation:

The ray diagram illustrates that, in the case of a concave mirror, the image size becomes equal to the object size when the object distance equals the radius of curvature, i.e, twice the focal length.

So, the object has to be placed at a distance of $(15 \times 2) = 30$ cm in front of the concave mirror.

18. (a) $\lambda_v < \lambda_y < \lambda_r$

Explanation: Colors and corresponding wavelengths of visible spectrum.

Color	Wavelength (nm)
Violet	380-450

Blue	450-475
Cyan	476-495
Green	495-570
Yellow	570-590
Orange	590-620
Red	620-750

19. **(a)** Atmospheric refraction
Explanation: Twinkling of stars is due to atmospheric refraction. Distant star acts like a point source of light. When the starlight enters the earth's atmosphere it undergoes refraction continuously, due to changing refractive index i.e. from Rarer to denser medium. It bends towards the normal successively, hence the amount of light enters our eyes fluctuates sometimes bright and sometimes faint.
20. **(d)** nephrons
Explanation: A nephron is a tissue, which is the basic structural and functional unit of the kidney. Its chief function is to regulate the concentration of water and soluble substances like sodium salts by filtering the blood, reabsorbing what is needed and excreting the rest as urine.
21. **(c)** pH paper
Explanation: pH paper is used on which the strength of acidic and basic solutions is represented by making use of the hydrogen ion concentrations in them.
22. **(d)** 25%
Explanation: The percentage of water absorbed = $\frac{12.5-10}{10} \times 100$
 $= 2.5 \times 10 = 25\%$
23. **(d)** increase
Explanation: Since $n = \frac{\sin i}{\sin r} = \text{constant}$, with an increase in i , r will increase.
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. **(b)** citric
Explanation: Lemon constitutes citric acid and is therefore referred under the category of citrus fruits.
26. **(d)** Hydroxide ions
Explanation: Any compound behaves as a base when it dissociates hydroxide ions (OH^-) in its solution.
27. **(a)** By a glass prism but not by rectangular glass slab.
Explanation: The angle of deviation through a triangular prism is the angle between the incident ray and the emerging ray (angle δ). However, in glass slab, the incident ray and the emergent ray are parallel to each other thus angle of incidence is equal to the angle of emergence.
28. **(b)** Conc. HNO_3 : Conc. HNO_3
1 : 3
Explanation: Aqua regia or nitro-hydrochloric acid is a highly corrosive mixture of acids, a fuming yellow or red solution. The mixture is formed by freshly mixing concentrated nitric acid and hydrochloric acid, optimally in a volume ratio of 1:3. Aqua regia is highly corrosive that it can dissolve metals, such as gold and platinum.
29. **(d)** H_2SO_3
Explanation: Sulphurous acid is formed on dissolving SO_2 in water.
30. **(b)** All of these
Explanation:
- When electricity is passed in water, it decomposes into hydrogen and oxygen. $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$
 - Nitrogen is an unreactive gas it prevents oxidation, in turn, it prevents the rancidity of chips.

- Melting of ice is a physical change because it is a change in only the physical properties of the substance and it can be reversed, i.e, the substance formed can be restored back to their original form.
- Corrosion occurs in the presence of moisture. For example, when the iron is exposed to moist air, it reacts with oxygen to form rust.

So, all statements are correct.

31. **(a)** Both A and R are true and R is the correct explanation of A.

Explanation: Both A and R are true and R is the correct explanation of A.

32. **(a)** Both A and R are true and R is the correct explanation of A.

Explanation: Large amount of heat is evolved which melts iron and can be used for welding.

33. **(c)** A is true but R is false.

Explanation: Nephrons are the basic filtration unit of kidneys. They carry out filtration, selective reabsorption and tubular secretion to form urine in kidney, which is then passed out through the urethra, via the ureters and urinary bladder.

34. **(a)** Both A and R are true and R is the correct explanation of A.

Explanation: Concave mirror converges the light rays falling on it to a point. So large concave mirrors are used to concentrate sunlight to produce heat in solar cookers.

35. **(d)** A is false but R is true.

Explanation: Magnification produced by mirror,

$$m = \frac{I}{O} = \frac{f}{f-u} = \frac{f}{x}$$

Where, x is distance from focus.

$$\text{and } m = \frac{\text{Size of image } (I)}{\text{Size of object } (O)}$$

36. **(d)** Citric acid

Explanation: Citric acid is not a mineral acid but an organic compound and it is found in citrus fruits. It is a natural preservative and a weak organic acid. It is mostly used as an anticoagulant and has a chelating property. All others are acidic in nature which in their aqueous solution dissociate into their respective ions.

37. **(b)** K and M

Explanation: Angle with the normal for the incident and emergent ray is to be measured.

38. **(b)** excretion

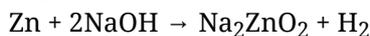
Explanation: Excretion is the process by which metabolic wastes and other non-useful materials are eliminated from an organism. In Human beings, kidneys are the organs that filter waste products from the blood. Therefore, Kidneys are the part of the excretory system.

39. **(b)** D

Explanation: On regular reflection $\angle r = \angle i$.

40. **(c)** IV

Explanation: Zinc reacts with sodium hydroxide on heating to produce hydrogen gas rapidly.



41. **(d)** convex mirror

Explanation: Both plane and convex mirror produce a virtual image. However, the image of a convex mirror is diminished always irrespective of the position of the object.

42. **(d)** all mirrors irrespective of their shape

Explanation: We know that from the laws of reflection, the incident ray, the reflected ray, and the normal to the reflecting surface all lie in the same plane. Also, the angle of reflection is equal to the angle of incidence.

The laws of reflection hold good for all reflecting surfaces irrespective of their shapes whether plane or curved.

43. **(a)** (ii) and (iv)

Explanation: Oxygenated blood circulates through the left part of the heart whereas deoxygenated blood

circulates through the right part of the heart. Atrium receives blood and the ventricle pumps the blood out of the heart.

44. **(b)** Concave mirror

Explanation: Because the screen is on the same side of the object which means it is never a lens because it happens behind the lenses in such case. Moreover Concave mirror forms real images i.e. image can be obtained on a screen.

45. **(c)** endosmosis rate will be more

Explanation: Endosmosis rate will be more.

46. **(b)** three different points

Explanation: Red, blue, and green lights have different wavelengths so they will be refracted accordingly. So three points of convergence on the principal axis exist.

47. **(c)** is directly proportional to the thickness of the glass slab.

Explanation: The lateral displacement of an incident ray passing out of a rectangular glass slab is directly proportional to the thickness of glass slab, angle of incidence, and refractive index however it is inversely proportional to the wavelength of the incident light.

48. **(c)** Au, Ag

Explanation: Gold and Silver do not react with oxygen. They are less reactive metals and lie at the bottom of the reactivity series.

Section C

49. **(a)** Triclosan

Explanation: Triclosan

50. **(b)** 1950

Explanation: 1950

51. **(c)** It is basic in nature

Explanation: It is basic in nature

52. **(c)** Calcium phosphate

Explanation: Calcium phosphate

53. **(b)** C and D

Explanation: C and D

54. **(a)** Fats

Explanation: Fats

55. **(c)** Ingestion → Digestion → Absorption → Assimilation

Explanation: Ingestion → Digestion → Absorption → Assimilation

56. **(b)** A, B, C, and F

Explanation: A, B, C, and F

57. **(d)** Bromine

Explanation: Bromine

58. **(a)** calcium

Explanation: calcium

59. **(d)** $\text{CuSO}_4 + \text{Fe}$

Explanation: $\text{CuSO}_4 + \text{Fe}$

60. **(d)** Both Diamond and Graphite

Explanation: Both Diamond and Graphite