

**Sample/Pre-Board Paper 16**  
**Class X Term 1 Exam Nov -Dec 2021**  
**Science (086)**

**Time: 90 Minutes****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

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

1. When  $\text{Ca}(\text{NO}_3)_2$  is heated, it gives  $\text{CaO}$ ,  $\text{NO}_2(\text{g})$  and  $\text{O}_2(\text{g})$ . The correct number of moles of  $\text{Ca}(\text{NO}_3)_2$ ,  $\text{CaO}$ ,  $\text{NO}_2(\text{g})$  and  $\text{O}_2(\text{g})$  are present in the reaction are respectively  
 (a) 1, 2, 4, 1 (b) 2, 2, 4, 1  
 (c) 2, 1, 3, 2 (d) 2, 2, 2, 1

2. A blue litmus paper was first dipped in dil.  $\text{HCl}$  and then in dil.  $\text{NaOH}$  solution. It was observed that the colour of the litmus paper-  
 (a) remains blue in both the solutions  
 (b) changed to red  
 (c) changed first to red and then to blue  
 (d) changed blue to colourless

3. Which one of the following is incorrect for metal?  
 1. In their pure state, metal have a shining surface.  
 2. The ability of metals to be drawn into thin wires is called malleability.  
 3. Metals are generally soft.  
 4. Some metal can be beaten into thin sheets.  
 (a) 1 and 2 (b) 2 and 3  
 (c) 3 and 4 (d) 1 and 4

4. Which of the following statement is correct regarding to physical changes?  
 (a) In physical change, new substance is formed.  
 (b) In physical change, no new substance is formed.  
 (c) In physical change, chemical composition of substance is changed.  
 (d) None of these

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

6. Which of the following are correctly matched?

1.	Dissolution	Solute gets dissolved in a solvent.
2.	Exothermic	Heat is absorbed.
3.	Reversible change	Reactants can be obtained.

Which of the above are correct?

- (a) 1 and 2 (b) 2 and 3  
 (c) 1 and 3 (d) 1, 2 and 3

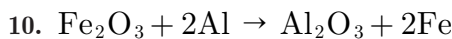
7. The substances you start with are called \_\_\_\_\_ and after the chemical change, what is formed is called the \_\_\_\_\_.  
 (a) reactants, gases (b) element, products  
 (c) element, compounds (d) reactants, products

8. Match the chemical substances given in column (A) with their appropriate application given in column (B)

	Column (A)		Column (B)
A.	Bleaching powder	(i)	Preparation of glass
B.	Baking soda	(ii)	Production of $\text{H}_2$ and $\text{Cl}_2$
C.	Washing soda	(iii)	Decolorization
D.	Sodium chloride	(iv)	Antacid

- (a) A- (ii), B- (i), C- (iv), D- (iii)  
 (b) A- (iii), B- (ii), C- (iv), D- (i)  
 (c) A- (iii), B- (iv), C- (i), D- (ii)  
 (d) A- (ii), B- (iv), C- (i), D- (iii)

9. .... indicator odour changes in acidic or basic media.  
 (a) Methyl orange (b) Phenolphthalein  
 (c) Olfactory (d) Ozonal



The above reaction is an example of a-

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

11. When a person eats some egg white, proteins and water enter the stomach. Which substances are found leaving the stomach and leaving the small intestine?

	Leaving the Stomach	Leaving the Small Intestine
(a)	Protein, amino acids and water	Water
(b)	Amino acids and water	Amino acids and water
(c)	Fatty acids, glycerol and water	Fatty acids, glycerol and water
(d)	Protein and water	Fatty acids and glycerol

12. Single cell organism take food by their

- (a) Entire surface
- (b) Food vacuole
- (c) Nucleus
- (d) Pseudopodia

13. Various chemical reactions in body use ..... for energy generation.

- (a) Nitrogen and carbon
- (b) Oxygen
- (c) Carbon sources and oxygen
- (d) None of the above

14. Which of the following is body's largest blood vessel?

- (a) Heart
- (b) Capillaries
- (c) Aorta
- (d) Pulmonary vein

15. Pigment haemoglobin is present in

- (a) WBC
- (b) blood platelets
- (c) bloods plasma
- (d) RBC

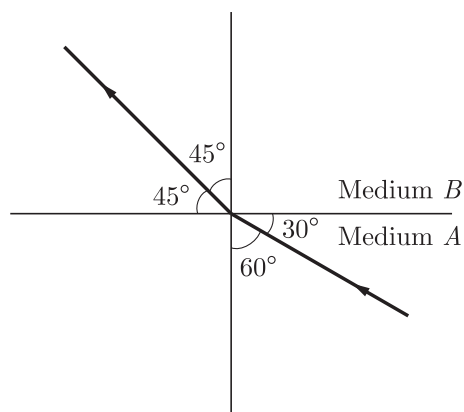
16. The waste product from skin is known as?

- (a) Salts
- (b) Urine
- (c) Sweat
- (d) Urea

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

- (a) Water
- (b) Glass
- (c) Plastic
- (d) Clay

18. Figure shows a ray of light as it travels from medium *A* to medium *B*. Refractive index of the medium *B* relative to medium *A* is-



- (a)  $\frac{\sqrt{3}}{\sqrt{2}}$
- (b)  $\frac{\sqrt{2}}{\sqrt{3}}$
- (c)  $\frac{1}{\sqrt{2}}$
- (d)  $\sqrt{2}$

19. What is the frequency of violet colour of wavelength  $4000 \text{ \AA}$ ?

- (a)  $7.5 \times 10^{10} \text{ Hz}$
- (b)  $7.5 \times 10^{12} \text{ Hz}$
- (c)  $7.5 \times 10^{14} \text{ Hz}$
- (d)  $3.75 \times 10^{16} \text{ Hz}$

20. What is the frequency of red colour of wavelength  $8000 \text{ \AA}$ ?

- (a)  $3.75 \times 10^{14} \text{ Hz}$
- (b)  $3.75 \times 10^{12} \text{ Hz}$
- (c)  $3.75 \times 10^{16} \text{ Hz}$
- (d) none of these

21. The refractive index of glass is  $3/2$ . The velocity of light in glass is

- (a)  $3 \times 10^8 \text{ m/s}$
- (b)  $2 \times 10^8 \text{ m/s}$
- (c)  $10^8 \text{ m/s}$
- (d)  $1.33 \times 10^8 \text{ m/s}$

22. An object is situated at a distance of  $f/2$  from a convex lens of focal length  $f$ . Distance of image will be

- (a)  $+(f/2)$
- (b)  $+(f/3)$
- (c)  $+(f/4)$
- (d)  $-f$

23. A convex lens of focal length 25 cm and a concave lens of focal length 10 cm are placed in close contact with each other. The power of this combination is-

- (a) 2 D
- (b) 6 D
- (c) -6 D
- (d) 9 D

24. The clear sky appears blue because

- (a) blue light gets absorbed in the atmosphere
- (b) ultraviolet radiations are absorbed in the atmosphere
- (c) violet and blue lights get scattered more than lights of all other colours by the atmosphere
- (d) light of all other colours is scattered more than the violet and blue colour lights by the atmosphere

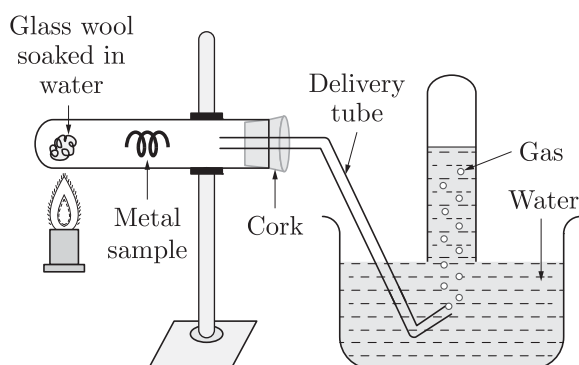
## Section B

Section - B consists of 24 questions (Sl. No.25 to 48). Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

25. What do we observe on pouring acetic acid on red and blue litmuts papers?
- Red litmus remains red and blue litmus turns red.
  - Red litmus turns blue and blue litmus remains blue.
  - Red litmus turns blue and blue litmus turns red.
  - Red litmus becomes colourless and blue litmus remains blue.

26. Which of following solution have a higher concentration of  $H^+$  ions?
- 1 M HCl solution
  - 1 M  $CH_3COOH$  solution
  - 0.5 M  $CH_3COOH$  solution
  - None of these

27. In the following practical set which of the following gas is emitted?



- Hydrogen
  - Carbon monoxide
  - Carbon dioxide
  - Nitrogen
28. Non-metals can't be used to make vessels but metals can. Why?
- Non-metals are not sonorous.
  - Metals can be drawn into wires, i.e. they possess ductility.
  - Non-metals are not lustrous.
  - Metals are good conductors of heat whereas non-metals are not.
29. A body wanted to remove the grease stain from our shirt. So he used a  $X$  solution. Here  $X$  solution is:
- Ammonium hydroxide
  - Magnesium hydroxide
  - Calcium hydroxide
  - Sodium hydroxide

30. The electron dot structure for sodium is

- $Na \cdot$
- $Na :$
- $\cdot \ddot{Na} \cdot$
- $:\ddot{Na}:$

31. **Assertion :** Olfactory indicators are those whose colour changes in acidic and basic medium.

**Reason :** They react with acidic and basic solutions.

- Both Assertion and Reason are true and Reason is the correct explanation of the Assertion.
- Both Assertion and Reason are true but Reason is not the correct explanation of the Assertion.
- Assertion is true but the Reason is false.
- Both Assertion and Reason are false.

32. **Assertion :** Corrosion of iron is a serious problem.

**Reason :** Every year an enormous amount of money is spent to replace damaged iron.

- Both Assertion and Reason are True and Reason is the correct explanation of the Assertion.
- Both Assertion and Reason are True but Reason is not the Correct explanation of the Assertion.
- Assertion is True but the Reason is False.
- Both Assertion and Reason are False.

33. **Assertion :** Haemoglobin is not the respiratory pigment in human beings.

**Reason :** It transports oxygen in the human body.

- Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- Assertion is true but Reason is false.
- Assertion is false but Reason is true.

34. **Assertion :** Planets do not twinkle.

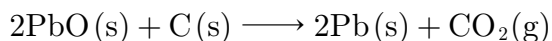
**Reason :** Planets do not show the phenomenon of scattering.

- Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- Assertion is true but Reason is false.
- Both Assertion and Reason are false.

35. Which of the following represents the correct order of the acidic strength for equimolar aqueous solutions of HCl,  $H_2SO_4$ ,  $NH_4OH$  and NaOH

- $HCl < NH_4OH < NaOH < H_2SO_4$
- $NH_4OH < NaOH < H_2SO_4 < HCl$
- $HCl < H_2SO_4 < NH_4OH < NaOH$
- $NaOH < NH_4OH < HCl < H_2SO_4$

36. Which of the statements about the reaction below are correct?



1. Lead is getting reduced.
  2. Carbon dioxide is getting oxidised.
  3. Carbon is getting oxidised.
  4. Lead oxide is getting reduced.
- (a) 1 and 2                      (b) 1 and 3  
(c) 1, 2 and 3                (d) All the above

37. The shape of guard cells changes due to change in the

- (a) Protein composition of cells
- (b) Temperature of cells
- (c) Amount of water in cells
- (d) Position of nucleus in the cells

38. This is the functional unit of the kidney?

- (a) Hilum                      (b) Neurons
- (c) Nephrons                (d) Medulla

39. The power of a combination of two lenses  $XY$  is 5 D if the focal length of lens  $X$  is 15 cm. The focal length of lens  $Y$  is-

- (a) 60 cm                      (b) -60 cm
- (c) 50 cm                      (d) -10 cm

40. A convex lens of focal length 25 cm and a concave lens of focal length 10 cm are placed in close contact with each other. The power of this combination is-

- (a) 2 D                      (b) 6 D
- (c) -6 D                      (d) 9 D

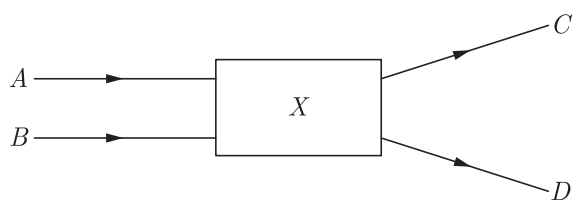
41. Oxygenated blood is pumped from heart to rest of the body via ?

- (a) Aorta                      (b) Pulmonary
- (c) Pulmonary vein        (d) Vena cava

42. Plants use the energy stored in ATP to accomplish the process of transportation of

- (a) Water and minerals    (b) Carbon dioxide
- (c) Oxygen                    (d) Food

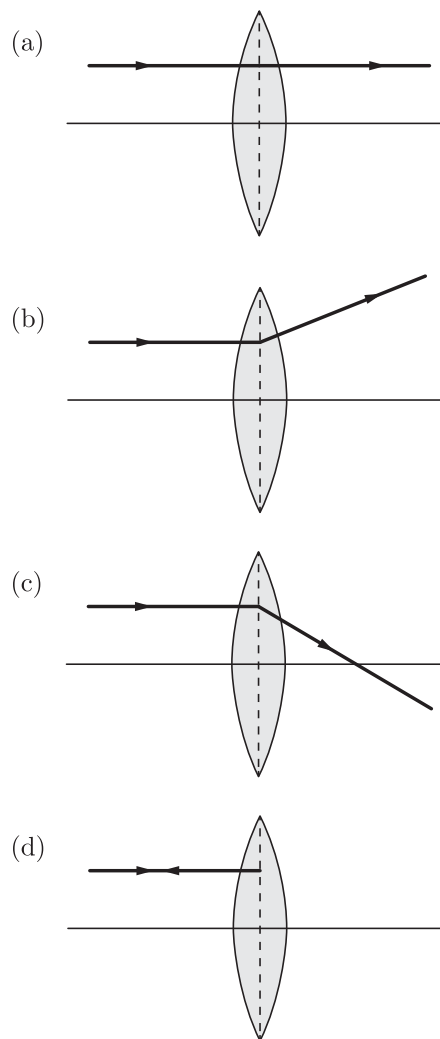
43. Light rays  $A$  and  $B$  fall on optical component  $X$  and come out as  $C$  and  $D$ .



The optical component is a

- (a) concave lens              (b) convex lens
- (c) convex mirror            (d) prism

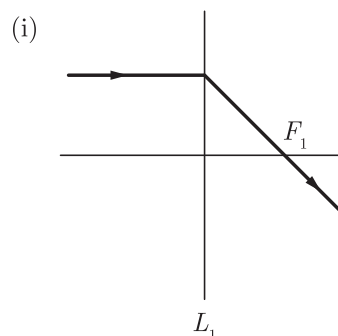
44. Which of the following correctly shows refraction of a ray of light from a convex lens?

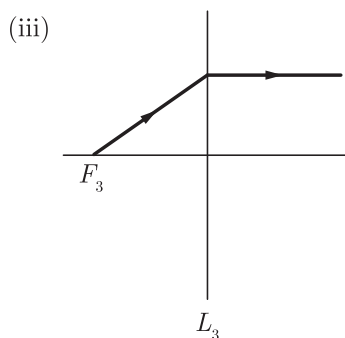
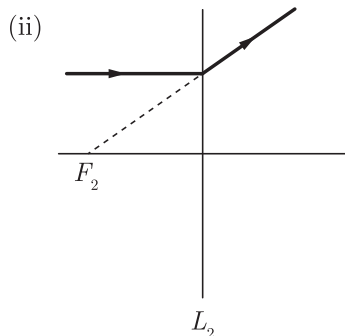


45. An object is placed at a distance of 10 cm from a convex mirror of focal length 15 cm. the position of the image is-

- (a) 6 cm                      (b) 9 cm
- (c) 8 cm                      (d) 7 cm

46. The following figures show the path of light rays through three lenses marked  $L_1$ ,  $L_2$  and  $L_3$  and their focal points  $F_1$ ,  $F_2$  and  $F_3$  respectively.





Which of the following diagram shows the concave lens properties?

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

47. The magnification of a concave mirror is  $-1$ . it implies that

- (a) the object must be at the focus of the concave mirror  
(b) the image formed is virtual  
(c) the image formed is erect  
(d) none of these

48. Which of the following is non-ductile?

- (a) Aluminium (b) Magnesium  
(c) Copper (d) Bromine

## 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 Based Questions: (49-52)

In chemistry a metal is an element that readily forms positive ions and has metallic bonds. A metal is a material that when freshly prepared, polished or fractured, shows a lustrous appearance and conducts electricity and heat relatively well. Metals are typically malleable or ductile.

The table shows the reaction of different metals with water.

Metal	Reaction with water	Reaction with steam
<i>P</i>	None	Mild
<i>Q</i>	Mild	Vigorous
<i>R</i>	Very slow	Vigorous
<i>S</i>	Vigorous	Violent

49. The current order of increasing reactivity of metals is:

- (a)  $P < R < Q < S$  (b)  $P < R < S < Q$   
(c)  $P < Q < R < S$  (d)  $S < Q < R < P$

50. Which metal is indicated by *R*?

- (a) Mg (b) Al  
(c) Fe (d) Cu

51. Which metal can displace *R* from its salt solution?

- (a) *P* (b) *Q*  
(c) *S* (d) Both (b) and (c)

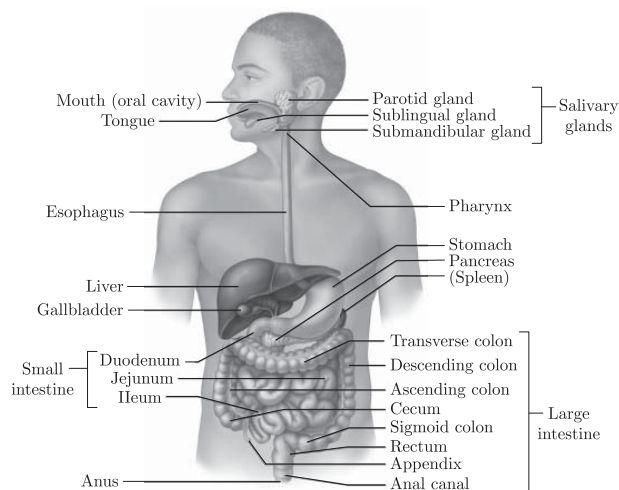
52. Which metal is likely to be displaced by *R*?

- (a) *P* (b) *Q*  
(c) *R* (d) *S*

### Case Based Questions: (53-56)

Digestion is a catabolic process in which complex and large components of food are broken down into their respective simpler and smaller forms with the help of various hydrolytic enzymes. In human beings, the process of intake of essential nutrients in the form of food takes place through an entire system in human includes alimentary canal and its associated digestive glands.

The alimentary canal is a muscular coiled tubular structure about 9 m in length that begins from mouth and ends with anus. The various organs of the human digestive system in sequence are: Mouth, Oesophagus (or Food pipe), Stomach, Small intestine and Large intestine. The glands which are associated with the human digestive system and form a part of the human digestive system are: Salivary glands, Liver and Pancreas. The ducts of various glands open into the alimentary canal and pour the secretions of the digestive juices into the alimentary canal.



53. In which of the following organ is digested?

- (a) mouth
- (b) stomach only
- (c) large intestine
- (d) stomach and small intestine

54. Which of the following is the final product of digestion of protein?

- (a) Glycerol
- (b) Amino acids
- (c) Glucose
- (d) Nitric acid

55. What are peristaltic movements?

- (a) Rhythmic contraction of canal
- (b) Movement of heart
- (c) Movement of ribs
- (d) Movement of body parts

56. Which of the following enzyme is present in Saliva?

- (a) Amylase
- (b) Pepsinogen
- (c) Trypsin
- (d) Lipase

### Case Based Questions: (57-60)

A student performs the experiment with a convex lens and he marked the table between image distance ( $v$ ) and object distance ( $u$ ).

	Object distance ( $u$ ) (cm)	Image distance ( $v$ ) (cm)
1	− 90	+18
2	− 60	+20
3	− 30	+30
4	− 20	+60
5	− 18	+90
6	− 10	+100

On the basis of the above table give the answer of following questions.

57. The focal length of the convex lens is:

- (a) − 15
- (b) +25
- (c) − 25
- (d) +15

58. In the table which observation is wrong?

- (a) S.No. 1
- (b) S.No. 4
- (c) S.No. 3
- (d) S.No. 6

59. If a convex lens is used to focus sunlight on a paper, where the paper should be placed so that it catches fire.

- (a) At 25 cm away from lens
- (b) At optical centre of lens
- (c) At principal focus.
- (d) At centre of curvature

60. The approximate value of magnification in case of S.No. 4 is

- (a) − 1
- (b) − 3
- (c) +4
- (d) +1