CBSE Sample Question Paper Term 1

Class – X (Session : 2021 - 22)

SUBJECT - SCIENCE - 086 - TEST - 03

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. The colour of copper sulphate solution is **[0.8]**

   a) Green
   b) Colourless
   c) Blue
   d) Pale green

2. Which of the following is most appropriate for aerobic respiration? **[0.8]**

   a) $\text{Glucose} \xrightarrow{cytoplasm} \text{pyruvate} \xrightarrow{mitochondria} CO_2 + H_2O + \text{Energy}$
   b) $\text{Glucose} \xrightarrow{mitochondria} \text{pyruvate} \xrightarrow{cytoplasm} CO_2 + H_2O + \text{Energy}$
   c) $\text{Glucose} \xrightarrow{cytoplasm} \text{pyruvate + Energy} \xrightarrow{mitochondria} CO_2 + H_2O$
   d) $\text{Glucose} \xrightarrow{cytoplasm} \text{pyruvate + Energy} \xrightarrow{mitochondria} CO_2 + H_2O + \text{Energy}$

3. A change is said to be a physical change when **[0.8]**

   a) No energy change occurs
   b) All statements are correct
   c) The change can be easily reversed
   d) No new substances are formed

4. A lens of focal length 'f' is cut into two equal parts without affecting its curvature. The two pieces will have equal focal length of : **[0.8]**

   a) $\frac{f}{2}$
   b) f
   c) $\frac{f}{3}$
   d) 2f

5. In an airtight experimental set-up which was used by you in the laboratory to study respiration in germinating seeds, the seeds obtained the oxygen for respiration from **[0.8]**

   a) water in the beaker
   b) air in the flask

c) water in the germinating seeds
d) water used for soaking the seeds

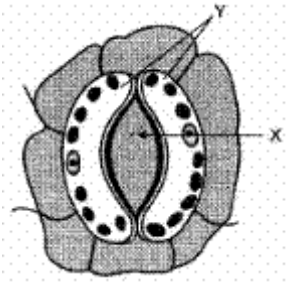
6. While doing experiment with candle to find focal length of a concave mirror, the candle is placed between: **[0.8]**

a) beyond focus
b) at focus
c) pole and focus
d) at infinity

7. What is the value of refractive index of the medium if the critical angle of incidence in a denser – rarer inter face is equal to 45^{o}? **[0.8]**

a) 3.25
b) 2.0
c) 1.414
d) 2.414

8. Four students, A, B, C and D, make the records given below, for the parts marked 'X' and 'Y' in this diagram. **[0.8]**



Student	X	Y
A	Stoma	Guard cell
B	Guard cell	Stoma
C	Epidermal cell	Stoma
D	Stoma	Epidermal cell

The correct record, out of these, is that of student :

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

9. Which of the following phenomena is based on atmospheric refraction **[0.8]**

A. Sun appears to rise 2 minutes before and 2 minutes later
B. Stars have seen higher than they actually are
C. Rainbow
D. The blue colour of clear sky

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

10. Identify the correct representation of reaction occurring during chloralkali process **[0.8]**

a) $2NaCl\ (aq) + 2H_2O(aq) \rightarrow 2NaOH\ (aq) + Cl_2\ (g) + H_2\ (g)$
b) $2NaCl\ (aq) + 2H_2O(l) \rightarrow 2NaOH(aq) + Cl_2\ (aq) + H_2\ (aq)$
c) $2NaCl\ (l) + 2H_2O(l) \rightarrow 2NaOH(l) + C1_2$
d) $2NaCl\ (aq) + 2H_2O\ (l) \rightarrow 2NaOH\ (aq)$

(g) + H_2 (g) + Cl_2 (g) + H_2 (g)

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

Column A	Column B
(i) Pulmonary artery	(a) Oxygenated blood
(ii) Pulmonary vein	(b) Exchange of substances
(iii) Aorta	(c) Supplies blood to body tissues/parts
(iv) Capillary	(d) Deoxygenated blood

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

12. Match the following with the correct response: **[0.8]**

(1) Liquid metal	(A) Silver
(2) Best conductor of heat	(B) Sodium
(3) Poorest conductor of heat	(C) Lead
(4) Metal that can be cut with a knife	(D) Mercury

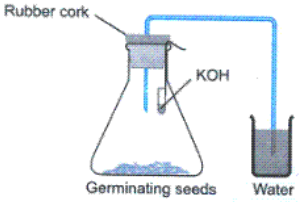
a) 1-A, 2-C, 3-B, 4-D
b) 1-B, 2-D, 3-A, 4-C
c) 1-D, 2-A, 3-C, 4-B
d) 1-C, 2-B, 3-D, 4-A

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

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

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

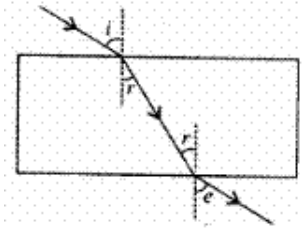
14. The germinating seeds present in the experimental set-up shown below **[0.8]**



a) take up CO_2 from the atmosphere
b) take up O_2 from the water
c) release CO_2 into the air in the flask
d) release O_2 into the air

15. While performing the experiment on tracing the path of a ray of light passing through a glass slab as shown in the given diagram, four students interpreted the results as given **[0.8]**

below. Which one of the four interpretations in correct?



a) $\angle r = \angle e$ b) $\angle i = \angle r$

c) $\angle r > \angle e$ d) $\angle i > \angle r$

16. Which of the following gases can be used for storage of fresh sample of an oil for a long time? **[0.8]**

a) Carbon dioxide or helium b) Nitrogen or oxygen

c) Carbon dioxide or oxygen d) Helium or nitrogen

17. Four students reported the following observation tables for the experiment, to trace the path of a ray of light passing through a glass slag for different angles of incidence. The observations, likely to be correct are those of student. **[0.8]**

∠i	∠r	∠e
30°	40°	30°
40°	50°	40°
50°	60°	50°

(I)

∠i	∠r	∠e
30°	20°	30°
40°	30°	40°
50°	40°	50°

(II)

∠i	∠r	∠e
30°	20°	40°
40°	30°	50°
50°	40°	60°

(III)

∠i	∠r	∠e
30°	20°	20°
40°	30°	30°
50°	40°	40°

(IV)

a) IV b) III

c) I d) II

18. The lateral displacement of an incident ray passing out of a rectangular glass slab **[0.8]**

a) independent of the thickness of the glass slab. b) None of these

c) is directly proportional to the thickness of the glass slab. d) inversely proportional to the thickness of the glass slab.

19. What is the observed colour of sky as seen from the moon surface? **[0.8]**

a) Black b) Blue

c) Red d) None of these.

20. During deficiency of oxygen in tissues of human beings, pyruvic acid is converted into lactic acid in the **[0.8]**

a) Golgi body b) Mitochondria

c) Chloroplast d) Cytoplasm

21. Plaster of Paris is made from **[0.8]**

a) Limestone
b) Quick lime
c) Gypsum
d) Slaked Lime

22. A star-shaped figure was cut in the black paper strip used for covering the leaf of a destarch plant used for demonstrating that light is necessary for photosynthesis. At the end of the experiment when the leaf was tested for starch with iodine, the star-shaped figure on the leaf was found to be : **[0.8]**

a) green in colour
b) blue-black in colour
c) brown in colour
d) colorless

23. An object moves a distance f between 2f and f of a concave mirror. The image would have travelled a distance of **[0.8]**

a) $\frac{f}{2}$
b) ∞
c) 2f
d) f

24. Which of the following phenomena is not the result of total internal reflection? **[0.8]**

a) Looming
b) Sparkles of the diamond
c) Mirage
d) Twinkling of stars

Section B

Attempt any 20 questions

25. A solution turns red litmus blue, its pH is likely to be **[0.8]**

a) 4
b) 1
c) 10
d) 5

26. Which of the following statement is true or false: **[0.8]**

Statement A: Salt formed when an acid reacts with metal is different than the salt formed when a base reacts with metal.

Statement B: Acetic acid is a weak acid but ammonia is a strong base.

a) Neither statement A nor statement B is true
b) Statement A is true, B is false
c) Both Statement A and B are true
d) Statement A is false, B is true

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

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

28. Which of the following has an electrovalent bond(s)? **[0.8]**

A. CaF
B. NaCl
C. MgO

D. CO_2

a) A and C
b) A, B and C
c) All of these
d) C and D

29. Toothpastes are generally **[0.8]**

a) natural
b) acidic
c) basic
d) neutral

30. For the reaction, $3Fe + 4H_2O \rightarrow Fe_2O_3 + 4H_2$. Which of the following statement is correct? **[0.8]**

A. Iron is oxidized
B. Water is reduced
C. Water act as reducing agent
D. Iron act as reducing agent

a) A, B and D
b) B and D
c) A and D
d) All of these

31. **Assertion (A):** When zinc is added to dilute hydrochloric acid, hydrogen is given off. **[0.8]**
Reason (R): Hydrogen chloride molecules contain hydrochloric acid and hydrogen atoms.

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):** Carbon monoxide is extremely poisonous in nature. **[0.8]**
Reason (R): Carbon monoxide is formed by the complete combustion of carbon.

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):** Blood pressure is arterial blood pressure. **[0.8]**
Reason (R): It is measured by a sphygmomanometer.

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):** For observing traffic at back, the driver mirror is a convex mirror. **[0.8]**
Reason (R): A convex mirror has a much larger field of view than a plane mirror.

a) Both A and R are true and R is the correct explanation of the assertion.
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):** There exist two angles of incidence for the same magnitude of deviation (except minimum deviation) by a prism kept in the air. **[0.8]**
Reason (R): In a prism kept in the air, a ray is incident on the first surface and emerges out of the second surface. Now if another ray is incident on the second surface (of the prism)

along the previous emergent ray, then this ray emerges out of the first surface along the previous incident ray. The particle is called the principle of reversibility of light.

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 gas is evolved when $NaHCO_3$ is heated? **[0.8]**

a) CO_2

b) CO

c) O_2

d) NO

37. If **e** and **i** are the emergent and incident angles, then for a rectangular glass slab **[0.8]**

a) e = $\frac{i}{2}$

b) e = 2i

c) e = i

d) e > i

38. Choose the function of the pancreatic juice from the following **[0.8]**

a) Trypsin digests proteins and lipase emulsified fats

b) Trypsin digests emulsified fats and lipase proteins

c) Trypsin and lipase digest fats

d) Trypsin digests proteins and lipase carbohydrates

39. A student is to find the focal length of a **[0.8]**

i. concave mirror,

ii. convex lens by using a distant object.

He will observe that the screen is on the same side as the object

a) in both the cases

b) in case (ii) but not in case (i)

c) in case (i) but not in case (ii)

d) in neither of the two cases

40. During the preparation of hydrogen chloride gas on a humid day, the gas is usually passed through the guard tube containing calcium chloride. The role of calcium chloride taken in the guard tube is to **[0.8]**

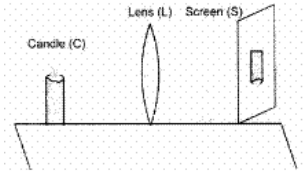
a) Absorb moisture from the gas

b) Absorb the evolved gas

c) Absorb Cl- ions from the evolved gas

d) Moisten the gas

41. A student performs an experiment on finding the focal length of a convex lens by keeping a lighted candle on one end of laboratory table, a screen on its other end and the lens between them as shown in the figure. The positions of the three are adjusted to get a sharp image of the candle flame on the screen.If now the candle flame were to the replaced by a distant lamp on a far away electric pole, the student would be able to get a sharp image of this distant lamp on the screen by moving **[0.8]**



a) the screen in the direction of the lens

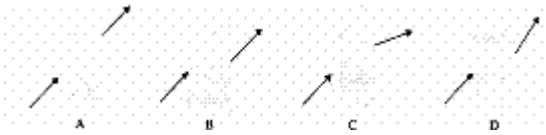
b) neither the screen nor the lens

or the lens away from the screen

c) the screen in the direction of the lens or the lens in the direction of the screen

d) the screen away fro the lens or the lens in the direction of the screen

42. Four students showed the following traces of the path of a ray of light passing through a rectangular glass slab. **[0.8]**



The trace most likely to be correctly is that of student

a) A

b) B

c) D

d) C

43. Which of the following is an incorrect statement? **[0.8]**

a) Energy is essential for life processes

b) Movement of molecules does not take place among cells

c) Organisms grow with time

d) Organisms must repair and maintain their structure

44. In which of the following, the image of an object placed at infinity will be highly diminished and point sized? **[0.8]**

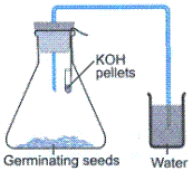
a) Concave mirror only

b) Convex lens only

c) Concave mirror, convex mirror, concave lens and convex lens

d) Convex mirror only

45. **[0.8]**



In the above experiment, water will rise in the tube because :

A. oxygen of air in the flask will be taken up by the germinating seeds.

B. carbon dioxide given out by the germinating seeds will be absorbed by KOH.

C. carbon dioxide given out will go through the glass tube and push water up into the tube.

D. Moisture in the germinating seeds will reach the water in the beaker through the delivery tube.

The correct reason of water to rise in the tube is

a) C

b) D

c) B

d) A

46. Which of the following statements is true? **[0.8]**

a) A concave lens has 4 dioptre power having a focal length 0.25 m

b) A concave lens has-4 dioptre power having a focal length of 0.25 m

c) A convex lens has –4 dioptre power

d) A convex lens has 4 dioptre power

having a focal length 0.25 m

having a focal length 0.25 m

47. 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

48. The ability of metals to be drawn into thin wire is known as **[0.8]**

a) conductivity

b) malleability

c) ductility

d) sonorousity

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:

In electrolysis, the electric current is used to carry out decomposition. Hence it is an electrolytic decomposition. During the electrolysis of water, the reaction involved is:

$2H_2O(l) \longrightarrow 2H_2\,(g) + O_2\,(g)$

49. During electrolysis, the charges carried by anode and cathode are respectively: **[0.8]**

a) +ve, -ve

b) -ve, +ve

c) each -ve

d) each +ve

50. The gases released respectively at anode and cathode during electrolysis of water is: **[0.8]**

a) H_2, O_2

b) O_2, no gas at the cathode

c) H_2, no gas at the cathode

d) O_2, H_2

51. The volume of gas collected at the cathode during the electrolysis of water is: **[0.8]**

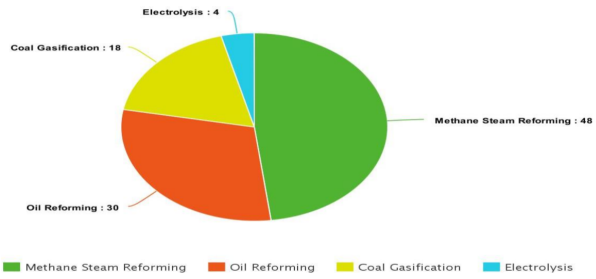
a) same as the volume of gas collected at the anode

b) half of the volume of gas collected at the anode

c) double of the volume of gas collected at the anode

d) one-fourth of volume of gas collected at the anode

52. Which is the most popular method of hydrogen production according to the pie chart given below? **[0.8]**



a) Oil reforming

b) Electrolysis

c) Methane steam reforming

d) Coal gasification

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

questions:

Breathing in humans involves three steps- Inspiration, gaseous exchange, and expiration. When we breathe in, ribs move up and flatten the diaphragm due to which the chest cavity increases. As a result, air moves into the lungs. During gaseous exchange haemoglobin binds with the oxygen and carries it along with the blood in the body. Oxygen diffuses into the cell and carbon dioxide diffuses into the blood. It is then carried to the lungs for expiration. During expiration, ribs move down and the diaphragm becomes dome-shaped decreasing the chest cavity thus pushing the air out of the lungs.

53. What is the correct sequence of air passage during inhalation? **[0.8]**

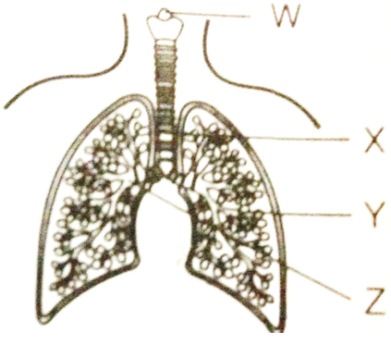
a) Nostrils ⟶ Pharynx ⟶ Larynx ⟶ Trachea ⟶ Alveoli

b) Nostrils ⟶ Larynx ⟶ Pharynx ⟶ Trachea ⟶ Lungs

c) Nasal passage ⟶ Trachea ⟶ Pharynx ⟶ Larynx ⟶ Alveoli

d) Larynx ⟶ Nostrils ⟶ Pharynx ⟶ Lungs

54. The diagram shows part of the human gas exchange system. **[0.8]**



What are W, X, Y, and Z?

a) Bronchus-X, Bronchiole-Z, Larynx-Y, trachea-W

b) Bronchus-W, Bronchiole-X, Larynx-Z, trachea-Y

c) Bronchus-Y, Bronchiole-W, Larynx-X, trachea-Z

d) Bronchus-Z, Bronchiole-Y, Larynx-W, trachea-X

55. In which organism the cell membrane acts as the respiratory surface? **[0.8]**

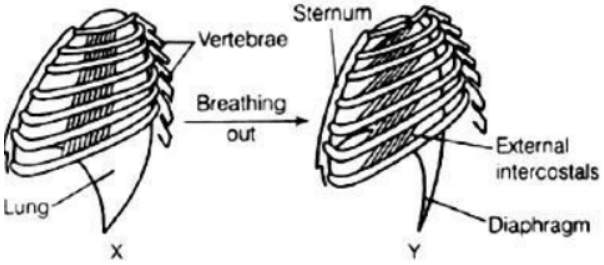
a) Lizards

b) Amoeba

c) Earthworms

d) Fish

56. The diagram shows the ribs and some of the muscles used in breathing: **[0.8]**



Which muscle relaxes in moving from position X to position Y?

a) Diaphragm-Yes, Intercostal muscle-No

b) Diaphragm-Yes, Intercostal muscle-Yes

c) Diaphragm-No, Intercostal muscle-

d) Diaphragm-No, Intercostal muscle-

Yes No

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

Sodium and chlorine are opposite charge ions that attach each other to form an ionic compound. In which sodium atom has 1 electron in its outermost M shell it loses 1 electron now L shell and obtained stable octet. While chlorine gains 1 electron to attain a stable configuration. They both combined to form NaCl. Ionic compounds have a high melting and boiling point. They are soluble in water.

57. Ionic compounds are held together by: **[0.8]**

a) van der Waal b) hydrogen bond

c) dipole- dipole d) strong electrostatic force

58. An ionic compound is formed by: **[0.8]**

a) both sharing of electron and transfer of electron b) sharing of electron

c) none of these d) transfer of electron

59. Ionic compound conducts electricity in a molten state because **[0.8]**

i. ions move freely
ii. the electrostatic force of attraction between ions is overcome due to heat
iii. ion is not able to move
iv. both (i) and (ii)

a) Option (ii) b) Option (iii)

c) Option (iv) d) Option (i)

60. The atomic number of an element Y is 17. The number of electrons in its ion Y^- will be **[0.8]**

a) 19 b) 20

c) 18 d) 17

Solution

SUBJECT - SCIENCE - 086 - TEST - 03

Class 10 - Science

Section A

1. **(c)** Blue
   Explanation: Copper sulfate is a sulfate salt of copper. It is a potent emetic and is used as an antidote for poisoning by phosphorus. It also can be used to prevent the growth of algae. The copper sulphate ($CuSO_4$) solution is blue in colour.
2. **(d)** Glucose $\xrightarrow{cytoplasm}$ pyruvate + Energy $\xrightarrow{mitochondria}$ CO_2 + H_2O + Energy
   Explanation: In aerobic respiration breakdown of pyruvate takes place in mitochondria. CO_2, H_2O and energy are released in the reaction.
3. **(b)** All statements are correct
   Explanation: Some of the characteristics of a physical change are:
   i. Temporary in nature.
   ii. No energy change occur.
   iii. Does not affect the internal structure of a substance, only the molecules are rearranged.
   iv. No new substance is formed.
   So all statements are correct.
4. **(b)** f
   Explanation: Since the lens is cut into two equal parts without affecting its curvature, it means the radius of curvature R is same for both parts and hence the focal length($F = \frac{R}{2}$) will remain same.
5. **(b)** air in the flask
   Explanation: The germinating seeds in the conical flask release CO_2 during respiration, which is absorbed by the KOH solution kept in the small test tube. This creates a partial vacuum in the flask that forces the water up the delivery tube. Thus, it proves that germinating seeds produce carbon dioxide during respiration.
6. **(d)** at infinity
   Explanation: For objects between f and 2f or centre of curvature, the image formed will be enlarged and beyond C.
7. **(c)** 1.414
   Explanation: The sine of the critical angle is equal to the reciprocal of the refractive index of that material i.e.
   sin c = $\frac{1}{\mu}$
   sin 45o = $\frac{1}{\mu}$
   $\frac{1}{\sqrt{2}} = \frac{1}{\mu}$
   $\mu = \sqrt{2} = 1.414$
8. **(a)** A
   Explanation: Stomatal pore is grounded by guard cell.
9. **(b)** A and B
   Explanation: Both of these phenomena are due to atmospheric refraction. The temperature and density of different layers of atmosphere keep varying. When the light enters the earth's atmosphere it undergoes refraction continuously, due to changing refractive index i.e. light travels from rarer to denser medium and hence It bends towards the normal successively.
10. **(d)** 2NaCl (aq) + $2H_2O$ (l) $\rightarrow$ 2NaOH (aq) + Cl_2 (g) + H_2 (g)
    Explanation: 2NaCl (aq) + $2H_2O$ (l) $\rightarrow$ 2NaOH (aq) + Cl_2 (g) + H_2 (g)

Chloralkali is a process used in industries to produce chlorine and sodium hydroxide (caustic soda). This happens because of the electrolysis of NaCl (commonly known as brine).

11. **(b)** (i) - (d), (ii) - (a), (iii) - (c), (iv) - (b)
Explanation:
    - A pulmonary artery is an artery in the pulmonary circulation that carries deoxygenated blood from the heart to the lungs.
    - The pulmonary veins are the veins that transfer oxygenated blood from the lungs to the heart.
    - The aorta is the largest artery that carries blood from the heart to other parts of the body.
    - Capillaries are the smallest type of blood vessel in the body. Their job is to enable the exchange of substances between the blood and surrounding tissues.

12. **(c)** 1-D, 2-A, 3-C, 4-B
Explanation: Mercury is a liquid at room temperature. It is used in making thermometers. The best conductor of heat and electricity is silver. Lead is a poor conductor of heat. Sodium is so soft that it can be cut with a knife.

13. **(c)** A, 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.

14. **(c)** release CO_2 into the air in the flask
Explanation: CO_2 is absorbed by KOH, air moves out from the tube to the flask resulting in rise of water level in the tube.

15. **(d)** $\angle i > \angle r$
Explanation: When light is entering from optically rarer to optically denser medium, the angle of incidence will be greater than the angle of refraction.
So, for parallel surfaces, refracting light, $\angle e = \angle i$ and for a denser medium $\angle r < \angle i$.

16. **(d)** Helium or nitrogen
Explanation: Oxygen cannot be used as it is an oxidizing agent. Helium can be used as it is an inert gas. Nitrogen is less reactive and it is cheaper than Helium. In most cases nitrogen is used in packet to prevent rancidity.

17. **(d)** II
Explanation: When light is entering from optically rarer to optically denser medium, the angle of incidence will be greater than the angle of refraction.
Since $\angle i = \angle e$ and $\angle r < \angle i$ for dense glass slab.

18. **(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.

19. **(a)** Black
Explanation: The sky appears blue due to the scattering of the blue colour by the earth's atmosphere. In moon there is no atmosphere hence nothing to scatter light. Thus, the sky appears dark or black as seen from the moon surface.

20. **(d)** Cytoplasm
Explanation: When there is a lack of oxygen Breakdown of Pyruvate takes place in the cytoplasm of muscle cells leading to the formation of Lactic acid.

21. **(c)** Gypsum
Explanation: On heating gypsum at a temperature of 100^{o} C, Plaster of Paris (POP) is obtained.
$2(CaSO_4.2H_2O) \rightarrow 2CaSO_4.H_2O + 3H_2O$

22. **(b)** blue-black in colour
Explanation: Iodine when added to starch gives blue-black colour.

23. **(b)** ∞
Explanation: Image of an object at 2f will be at 2f, while it will be at ∞, if object is at f.

24. **(d)** Twinkling of stars
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 sometime bright and sometime faint.

Section B

25. **(c)** 10
Explanation: If a red litmus paper turn blue, it means the solution is basic which indicates that it has a higher pH.

26. **(b)** Statement A is true, B is false
Explanation: When an acid reacts with metal it forms an acidic salt whereas when a base reacts with a metal it forms a basic salt.
Acetic acid is a weak acid and ammonia is also a weak base.

27. **(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.

28. **(b)** A, B and C
Explanation: Carbon is a tetravalent element and does not lose or gain electrons easily to form electrovalent bonds. It forms covalent bonds with other elements.

29. **(c)** basic
Explanation: Toothpaste are generally basic because their function is to react with the excess acid in our mouth and thus prevent tooth decay.

30. **(a)** A, B and D
Explanation: Fe is oxidized water is reduced so Fe is a reducing agent.

31. **(b)** Both A and R are true but R is not the correct explanation of A.
Explanation: The metal zinc readily reacts with hydrochloric acid to produce hydrogen gas (H_2) and zinc chloride ($ZnCl_2$).

32. **(c)** A is true but R is false.
Explanation: Carbon monoxide is extremely poisonous in nature. It is formed by incomplete combustion of carbon.

33. **(b)** Both A and R are true but R is not the correct explanation of A.
Explanation: Both A and R are true but R is not the correct explanation of A.

34. **(a)** Both A and R are true and R is the correct explanation of the assertion.
Explanation: A convex mirror is used as a driver mirror for rearview because it has a much larger field view as compared to plane mirror.

35. **(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.

36. **(a)** CO_2

Explanation: When sodium hydrogen carbonate is heated, it decomposes to give sodium carbonate with the evolution of Carbon dioxide gas.
$2NaHCO_3 \rightarrow Na_2CO_3 + CO_2 + H_2O$

37. **(c)** e = i
Explanation: For parallel surfaces, e = i should be obeyed.

38. **(a)** Trypsin digests proteins and lipase emulsified fats
Explanation: Trypsin breaks down proteins into the polypeptides and Lipase digest emulsified fat molecules into fatty acids and glycerol.

39. **(c)** in case (i) but not in case (ii)
Explanation: The mirror reflects while the lens refracts the light.

40. **(a)** Absorb moisture from the gas
Explanation: Absorb moisture from the gas.
Calcium chloride is a good dehydrating agent. It absorbs moisture or water content from the gas making it dry. Calcium chloride is widely used as a desiccant for drying gases and liquid hydrocarbons in many industries due to its ability to absorb water.

41. **(c)** the screen in the direction of the lens or the lens in the direction of the screen
Explanation: The candle is closer to the lens when compared to the distant lamp. Hence, the image of the candle will be farther away from the lens when compared to the image of the distant lamp. As the image will be more close to focus as the distance of the object is larger.

42. **(b)** B
Explanation: The emergent ray, from the rectangular glass slab, is parallel to the incident ray and is laterally displaced to the left (or lower side) of the incident ray.

43. **(b)** Movement of molecules does not take place among cells
Explanation: The movement of molecules is a vital process. Movement of molecules in cells takes place in active and passive modes such as diffusion, osmosis, facilitated diffusion, etc.

44. **(c)** Concave mirror, convex mirror, concave lens and convex lens
Explanation: In case of all of the above, when an object is at infinity, image is highly diminished and point sized.

45. **(c)** B
Explanation: CO_2 produced is absorbed by KOH solution, air from the tube enter the flask which pulls the water up in the tube.

46. **(d)** A convex lens has 4 dioptre power having a focal length 0.25 m
Explanation: The power P of a lens of the focal length is given by $P = \frac{1}{f}$, where f is the focal length in meter and power in dioptre
$P = \frac{1}{f} or f = \frac{1}{P} = \frac{1}{4} = 0.25m$
The positive value for focal length indicates a convex lens.

47. **(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.

48. **(c)** ductility
Explanation: The ability of metals to be drawn into the thin wire is called ductility. It is one such property of metals that are used to make wires from metals. Due to high ductility, copper can be drawn into long and thin wires without breaking.

Section C

49. **(a)** +ve, -ve
Explanation: +ve, -ve

50. **(d)** O_2, H_2
Explanation: O_2, H_2

51. **(c)** double of the volume of gas collected at the anode
Explanation: double of the volume of gas collected at the anode

52. **(c)** Methane steam reforming
Explanation: Methane steam reforming

53. **(a)** Nostrils ⟶ Pharynx ⟶ Larynx ⟶ Trachea ⟶ Alveoli
Explanation: Nostrils ⟶ Pharynx ⟶ Larynx ⟶ Trachea ⟶ Alveoli

54. **(d)** Bronchus-Z, Bronchiole-Y, Larynx-W, trachea-X
Explanation: Bronchus-Z, Bronchiole-Y, Larynx-W, trachea-X

55. **(b)** Amoeba
Explanation: Amoeba

56. **(b)** Diaphragm-Yes, Intercostal muscle-Yes
Explanation: Diaphragm-Yes, Intercostal muscle-Yes

57. **(d)** strong electrostatic force
Explanation: strong electrostatic force

58. **(d)** transfer of electron
Explanation: transfer of electron

59. **(c)** Option (iv)
Explanation: Option (iv)

60. **(c)** 18
Explanation: 18