

# SCIENCE OLYMPIAD

PRACTICE BOOK



GRADE  
**7**

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# Preface



Our education system effectively provides an introduction to the concepts of Math and Science and helps us understand the underlying concepts. But in its overly generalized approach, which aims to enlighten and test all students of varying caliber and interests, it leaves the exploration of application of all these concepts completely on the students.

This workbook is designed to enable students to explore Science effectively. Designed in accordance with the requirements of the Science Olympiads, the workbook is an efficient tool to achieve comprehensive success at the **ISFO – Science Olympiad**.

The main aim of this workbook is to assist students in developing and improving their ability to solve problems.

Each chapter of the book consists of 3 sets of questions.

- **Section A** (Scientific Reasoning) : This section is created to test the knowledge of scientific concepts and topics pertaining to the respective grades.
- **Section B** (Everyday Science) : This section deals with the application of the concept learnt.
- **Section C** (BrainBox) : Questions to prepare students with HOTS (Higher Order Thinking Skills), based on the syllabus provided.

**Logical Reasoning** section is provided to equip students with verbal and non-verbal analysis and reasoning skills.

**Sample Test Papers** and Answer keys have been provided to accelerate the learning process.



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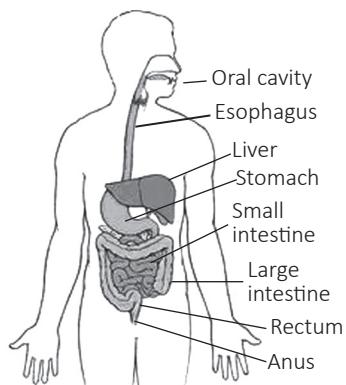
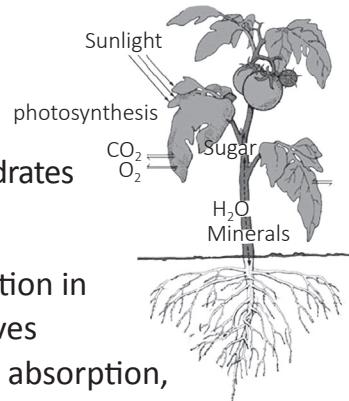
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# Nutrition in Plants and Animals

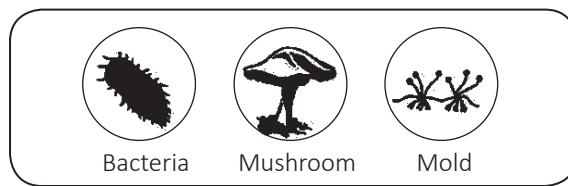
- Nutrition is the mode of taking food by an organism and its utilization by the body.

- Complex chemical substances like carbohydrates are the product of photosynthesis.

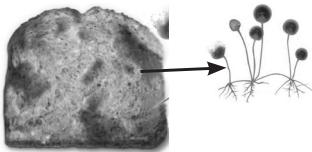


- The process of nutrition in human beings involves ingestion, digestion, absorption, assimilation and egestion.
- Digestion of carbohydrates, like starch begins in the buccal cavity and the digestion of protein starts in the stomach.
- The undigested and unabsorbed residues are expelled out of the body through anus.

- The grazing animals like cows, buffaloes and deers quickly ingest and swallow their leafy food and store it in rumen and thus are called ruminants.
- Fungi derive their nutrition from dead and decaying matters. They are called saprotrophs.



## SECTION - A : SCIENTIFIC REASONING

1. Which of the following shows the correct order of the various steps of human nutrition?
  - a. Ingestion, egestion, digestion, absorption and assimilation
  - b. Ingestion, egestion, assimilation, absorption and digestion
  - c. Ingestion, assimilation, digestion, absorption and egestion
  - d. Ingestion, digestion, absorption, assimilation and egestion
2. In man, the taste buds for bitter taste are present on the tongue at the :
  - a. Tip
  - b. Posterior end
  - c. Mid dorsal
  - d. Lateral side
3. The small intestine receives \_\_\_\_\_ to digest carbohydrate, fats and proteins.
  - a. Secretions from liver and pancreas
  - b. Secretions from bile duct and saliva
  - c. Secretions from saliva and gall bladder
  - d. Secretions from small intestine and liver
4. Which of the following statements is correct about the animal shown in the given figure?
5. Peristalsis movement can be defined as the :
  - a. Longitudinal movements of the muscle of stomach.
  - b. Longitudinal movements of the muscles of intestine
  - c. Circular movement of the muscles of food canal.
  - d. Rhythmic movement of the muscles of food canal.
6. Pitcher plant is green in colour but it eats insects to complete the requirement of \_\_\_\_\_.
  - a. Nitrogen
  - b. Salt
  - c. Carbon
  - d. Oxygen
7. What is illustrated by the given figure?
8. X and Y are two plants with following features.

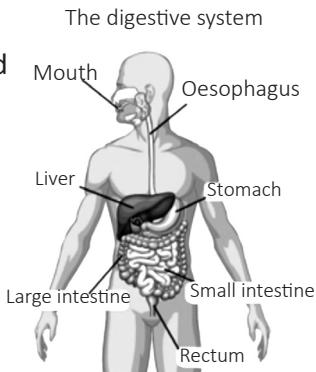
X – Parasitic plant with yellow, slender and tubular stem.

Y – Plant with both autotrophic and heterotrophic modes of nutrition.
- Identify X and Y.

X	Y
a. Venus fly trap	Pitcher
b. Pitcher	Cuscuta
c. Cuscuta	Pitcher
d. China rose	Rose

9. The given figure shows some labelled parts of human digestive system.

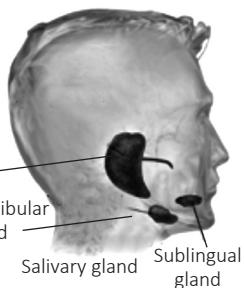
Which of the labelled parts releases green to yellowish fluid that assists in fat digestion and its absorption in the gut?



- a. Mouth
- b. Liver
- c. Large intestine
- d. Rectum

10. The given figure shows the parts of salivary glands.

Identify the part responsible for the secretion of saliva to begin the digestion of starches in human body.



- a. Parotid gland
- b. Submandibular gland
- c. Sublingual gland
- d. Both b and c

11. Match the given terms in Column I with their definitions in Column II.

Column I	Column II
I. Nutrition	A. Organism deriving its food from the dead and decaying plants and animals.
II. Parasite	B. Association of two different organisms in which both are benefited.
III. Saprophyte	C. The process of obtaining and utilizing food.
IV. Symbiosis	D. Organism that derives its food from the living body of another organism.

- a. I- B, II- C, III- D, IV- A
- b. I- C, II- D, III- A, IV- B
- c. I- D, II- A, III- B, IV- C
- d. I- A, II- B, III- C, IV- D

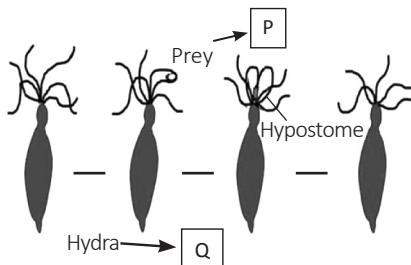
12. Read the given statements and select the correct option.

Statement I: Chewing breaks down the food into small pieces and assists in digestion process.

Statement II: Chewing increases the surface area of food for the saliva to act upon.

- a. Both the statements, I and II are true and statement II is the correct explanation of statement I.
- b. Both the statements I and II are true but statement II is the incorrect explanation of statement I.
- c. Statement I is true but statement II is false.
- d. Both the statements I and II are false.

13. Refer the given figure. What does it represent?



- a. Symbiotic mode of nutrition as both the organisms P and Q are being benefited in the process.
- b. Predatory mode of nutrition as organism P is being eaten by organism Q.
- c. Autotrophic mode of nutrition as organism Q is obtaining food for itself.
- d. Parasitic mode of nutrition as organism P is being harmed by organism Q.

14. Fungi appear suddenly during the rainy season because:
- When fungal spores present in the air come in contact with warm things, they germinate and grow.
  - During rainy season, there are more chances of things getting wet, which facilitates germination and growth of fungal spores.
  - Fungi have a saprophytic mode of nutrition.
  - Fungi secrete digestive juices on the dead and decaying matter and convert it into a solution.
15. In the box shown here Q represents the partner that absorbs mineral and R, represents lichen. What can be P?
- $$Q + R = P$$
- I. Autotrophic partner  
II. Blue-green algae  
III. Algae
- Only I
  - Only II
  - I, II and III
  - I and III

## SECTION - B : EVERYDAY SCIENCE

16. Aryan is a poor farmer. He cannot spend money on buying fertilizers. What should he do to increase the fertility of his farmland?
- He should water his field more frequently.
  - He should grow eucalyptus trees in his field.
  - He should grow mustard plants in his field.
  - He should grow pea plants in his field.
17. "Joei is on one day fast ". What is correct about nutrition in Joei's body?
- Glycogen reserve is being consumed in her body.
  - There would be severe reduction in vitamin, nutrient and energy intake in her body.
  - Both a and b
  - None of these
18. Reeta, ate street food yesterday and fell ill. She has been passing watery stool since last night. Which of the following is incorrect about this situation?
- a. It is a symptom of diarrhoea.
- b. it may be caused by an infection, food poisoning or indigestion.
- c. The patient should not be given anything, even water, without consulting a doctor.
- d. A solution of boiled and cooled water, salt and sugar, known as ORS, should be given even before a doctor is consulted.
19. 'Anant and Atharv took wet bread slices. Anant wrapped that wet bread slice in a polybag and then kept it in a warm place. Atharv kept that wet bread slice in the refrigerator. They did not touch the bread slices for 3 days. When they took out the bread slices after 3 days they observed some changes.'
- Based on their observation, they inferred the following:
- A greenish but cotton-like threads on Anant's bread slice are observed.
  - No observable change seen on Atharv's bread slice as it was kept in lower temperature.

- III. Fungi grew on Anant's bread slice as they are saprotrophs.
- IV. Fungi show a symbiotic relationship with bread slice.

Which of the given statements are correct?

- I & II
- I, II, & III
- I & IV
- I, II & IV

20. Human digestive system is different from that of the grass-eating animals. Some of the dissimilarities between them are given below. Choose the incorrect one.

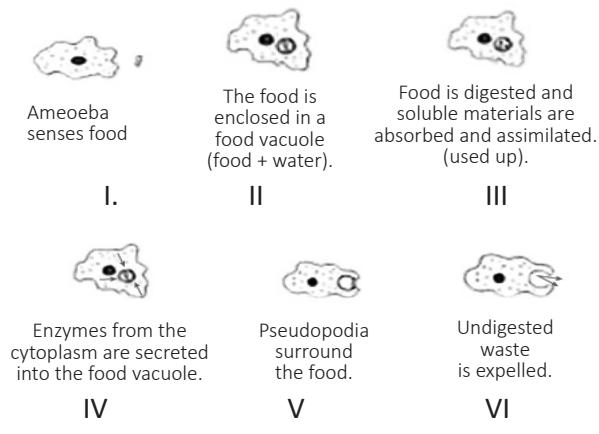
- Digestion in both humans and grass-eating animals starts in the mouth
- Animals quickly swallow their food and store it in a part of stomach called rumen
- Grass-eating animals can digest cellulose but humans cannot.
- All are incorrect.

### SECTION - C : BRAINBOX

21. Which of the following is correct about the guard cells of stomata?

- Guard cells are specialised crescent-shaped epidermal cells.
  - Guard cells flank stomata.
  - They regulate gas exchange and water loss through the opening and closing of stomata.
- I and II
  - II and III
  - I, II and III
  - I and III

22. Choose correct option showing proper order of holozoic nutrition in amoeba.



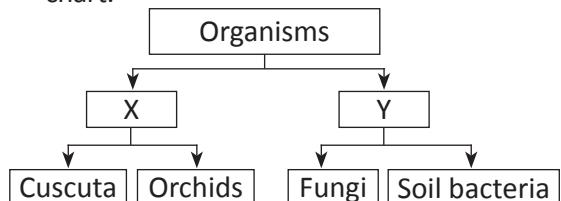
- I, V, II, III, IV, VI
- I, II, III, IV, V, VI
- II, III, I, IV, V, VI
- III, II, I, VI, V, IV

23. X is the process by which the digested food, carried by the blood is taken in by the cells of the body. Which of the following is correct about X?

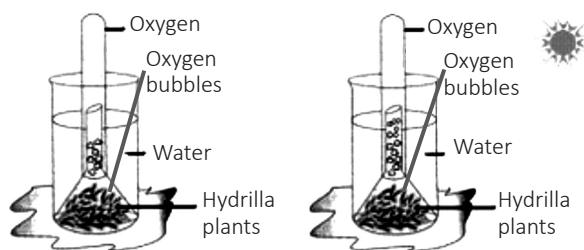
- It is involved in the breakdown of large food molecules into simpler molecules.
- It helps in the ejection of the undigested food out of the body.
- It is the process of exchange of oxygen and carbon dioxide between the blood and the cells of the body

- I and II
- II and III
- I, II and III
- None of these

24. Identify X and Y from the given classification chart.



- a. X- Parasites, Y – Saprotrophs  
 b. X – Symbiotics Y – Parasites  
 c. X – Autotrophic Y – Insectivorous  
 d. None of these
25. Identify the correct option with regard to the given figure.



- I. More bubbles will be observed in A, in 10 minutes.
  - II. More bubbles will be observed in B, in 10 minutes.
  - III. No bubble will be observed in either A or B.
  - IV. Same number of bubbles will be observed in A and B in 10 minutes.
- a. I and II  
 b. II and III  
 c. Only II  
 d. Only III

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Darken your choice with HB pencil -

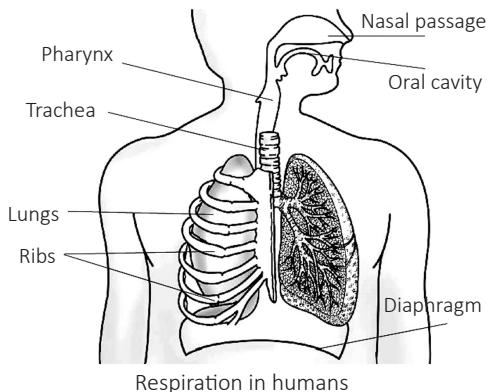
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| 2. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 9. <input type="radio"/> a  | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 16. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 23. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
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| 4. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 11. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 18. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 25. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
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| 6. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 13. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 20. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |
| 7. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 14. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 21. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |

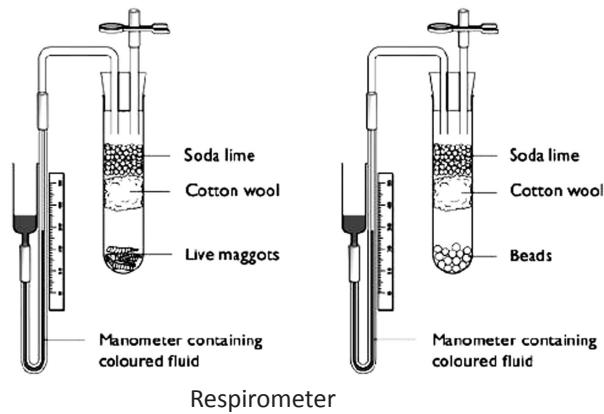
# Respiration in Organisms

→ Respiration releases energy from the food.

- The oxygen that we inhale breaks down the glucose into carbon dioxide and water. This releases energy.
- Aerobic respiration uses oxygen to break down the food. Anaerobic respiration does not use oxygen.
- Breathing is a process of respiration during which oxygen is inhaled and carbon dioxide is exhaled.
- Plants use their leaves and roots to take in air.
- Respiration can be measured using a device called respirometer.
- Increase in the physical activity enhances the rate of breathing.
- In animals like cows, dogs and cats, the process of breathing and the respiratory organs are similar to those in humans.



Respiration in humans



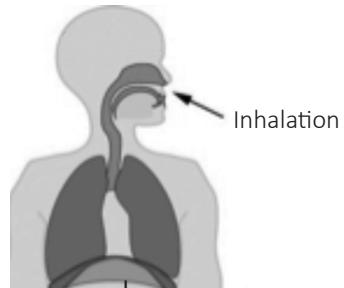
Respirometer

## SECTION - A : SCIENTIFIC REASONING

1. What is the purpose of the little hair inside the nose?
    - a. To fight against diseases.
    - b. To allow dust in the lungs.
    - c. To tickle the nose and cause sneeze.
    - d. To help in breathing dust free air.
  2. The rate of respiration in aquatic organisms is
    - a. Slower than the rate of respiration in terrestrial organisms.
    - b. Faster than the rate of respiration in terrestrial organisms.
    - c. Faster than the rate of respiration in aerial organisms.
    - d. Slower than the rate of respiration in aerial organisms.
  3. Which of the following is not transported by plasma?
    - a. Food
    - b. Oxygen
    - c. Carbon dioxide
    - d. Nitrogenous wastes
  4. X has thick and elastic walls; it carries blood away from the heart. Y does not have thick walls but has valves to ensure that the blood flows in one direction. Y carries the blood towards the heart.

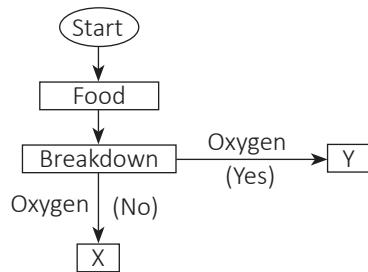
Here X and Y are

    - a. X – Vein; Y – Artery
    - b. X – Artery; Y – Vein
    - c. X – WBC; Y – Artery
    - d. X – Capillary; Y – Artery
  5. Identify the substance(s) present in higher amount in exhaled air compared to that in inhaled air.
    - I. Oxygen
    - II. Carbon dioxide
  - III. Water vapour
  - IV. Nitrogen
    - a. I and II
    - b. Only II
    - c. Only IV
    - d. III and I
6. When we breathe in air, we breathe in other gases also which are not required by our body. How does the body deal with these gases?
    - a. These gases are exhaled out instantly, letting in only the useful gases.
    - b. These gases are filtered by tiny hairs present inside our nose.
    - c. These gases are not absorbed by the lungs and they exhale them out.
    - d. These gases are converted into oxygen by the lungs.
  7. Which of the following is correct about dust particles inhaled while breathing?
    - a. When any dust particle is inhaled, it gets trapped in the hairs present in our nasal cavity.
    - b. Sometimes, instead of getting trapped by the hairs, they reach the lining of the nasal cavity and cause irritation.
    - c. Sneezing helps to expel foreign particles from inhaled air and the clean air enters the body.
    - d. All of these
  8. Which of the following is/are correct about the figure shown here?



1. I – Diaphragm contracts  
 2. II – Diaphragm relaxes  
 3. I – lungs expand  
 4. II – lungs contract
- a. 1 and 3                    b. 2, 3 and 4  
 c. 1, 2, 3 and 4            d. Only 4
9. Read the following condition and choose the correct statements for it.  
 The supply of oxygen is less and energy requirement is high.
- I. Here, cell will respire aerobically.  
 II. Here, cell will respire anaerobically.  
 III. Complete breakdown of glucose will take place.  
 IV. Complete breakdown of glucose will not take place.
- a. I and III                b. II and IV  
 c. III and II              d. I and IV
10. The correct passage of air in the human body is:
- a. Larynx → Nasopharynx → Nasal cavity → Bronchi → Trachea → Bronchioles  
 b. Nasal cavity → Larynx → Trachea → Bronchi → Bronchioles → Alveoli  
 c. Nasopharynx → Larynx → Nasal cavity → Trachea → Bronchi → Bronchioles → Alveoli  
 d. Trachea → Nasopharynx → Nasal cavity → Bronchi → Bronchioles → Alveoli
11. The chemical equation for aerobic cellular respiration is:
- a.  $C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O + ATP$   
 b.  $C_6H_{12}O_6 + H_2O \rightarrow CO_2 + O_2 + ATP$   
 c.  $C_6H_{12}O_6 + \text{Lactic acid} \rightarrow CO_2 + H_2O + ATP$   
 d.  $C_6H_{12}O_6 \rightarrow \text{Lactic acid} + H_2O + ATP$

12. Read the flowchart shown here and choose the correct option for X and Y.



- a. X – Lactic acid, Y – Carbon dioxide  
 b. X – Water vapour, Y – Oxygen  
 c. X – Glucose, Y – Alcohol  
 d. X – Lactic acid, Y – Water

13. What happens to the diaphragm and the ribcage during the exhalation of air?

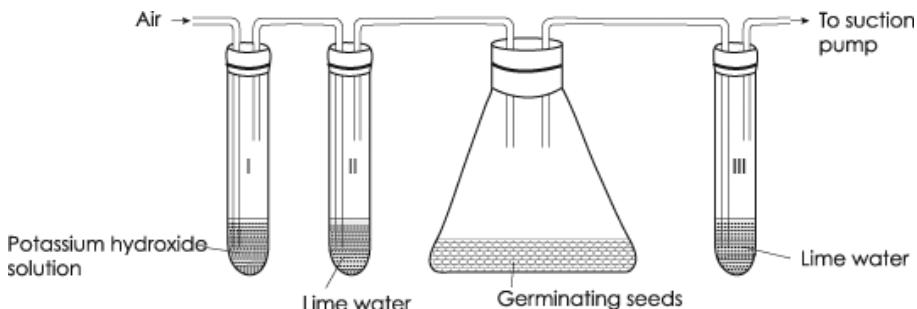
Diaphragm	Ribcage
a. Becomes flatten	Moves outward and upward
b. Becomes more curved	Moves downward and inward
c. Moves downward	Moves closer together
d. Becomes flatten	Moves downward and inward

14. Match column I with column II and select the suitable option for this.

Column I	Column II
I. Earthworm	A. Pulmonary respiration
II. Buffalo	B. Bronchial respiration
III. Butterfly	C. Tracheal respiration
IV. Prawn	D. Cutaneous respiration

- a. I- A, II- D, III- C, IV- B  
 b. I- D, II- C, III- A, IV- B  
 c. I- D, II- A, III- C, IV- B  
 d. I- D, II- A, III- B, IV- C

15. Eshani sets up an experiment as shown in the given figure. What will be her observation after some time?



- a. Lime water in test tube Q turns milky.
- b. Lime water in test tube Q does not turn milky.
- c. Lime water in test tube R turns milky.
- d. Potassium hydroxide solution in test tube P turns blue.

## SECTION - B : EVERYDAY SCIENCE

16. Aman does strenuous exercise daily. Once after the exercise, he felt a muscular cramp in his leg. This is due to:

- a. Accumulation of pyruvic acid.
- b. Accumulation of lactic acid.
- c. Slow blood circulation.
- d. Aerobic inspiration.

17. A girl having muscle cramp went for hot water bath as suggested by an orthopedic. What is/are the effect(s) of hot water bath in her body?

- I. Hot water bath or massage improves the circulation of blood in her body.
  - II. It enhances the supply of oxygen to the muscle cells.
  - III. It leads to complete breakdown of lactic acid into  $\text{CO}_2$  and water
- a. I and II
  - b. II and III
  - c. Only II
  - d. I, II and III

18. Which of the following is/are correct about the figure shown here?

- I. The rate of breathing in the man is increased.

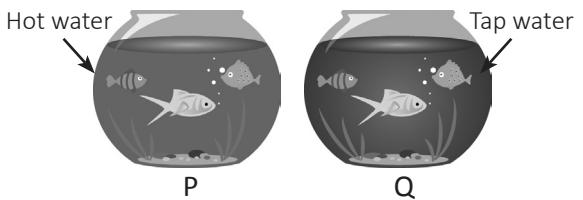
II. The rate of breathing in the man is decreased

III. Higher amount of energy is required by his body.

- a. Only I
- b. I and III
- c. Only II
- d. I, II and III



19. Fish were kept in two different aquariums as shown in the figure. Fish in which of the two will live longer and why?



- a. Q, because the concentration of oxygen is not less in this aquarium.
- b. P, because the concentration of oxygen is less in this aquarium.
- c. P, because the concentration of carbon dioxide is less in this aquarium.
- d. None of these.

20. Which of the following is correct about the exchange of gases in the animal shown here?



- I. Exchange of air between the environment and the animal takes place through spiracles.

II. Exchange of air between the environment and the animal takes place through stigmata.

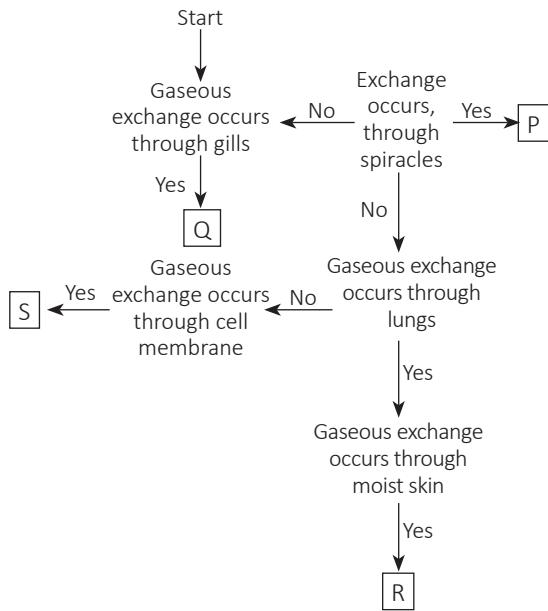
III. Exchange of air between the environment and the animal does not take place.

- a. Only I                          b. Only II  
c. Both I and II                d. Only III

### SECTION - C : BRAINBOX

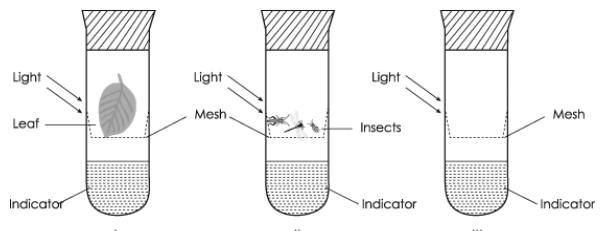
21. Study the given flowchart about respiratory structures in different organisms

Identify the organisms P, Q, R and S.



P	Q	R	S
a. Cockroach	Tadpole	Sparrow	Earthworm
b. Grasshopper	Fish	Frog	Amoeba
c. Spider	Amoeba	Tadpole	Crab
d. Parrot	Paramecium	Ostrich	Leech

22. Three test tubes are set up as shown in the given figure. The indicator used changes from red to yellow when exposed to increased levels of carbon dioxide. At the start of the experiment, the indicator in each test tube was red.



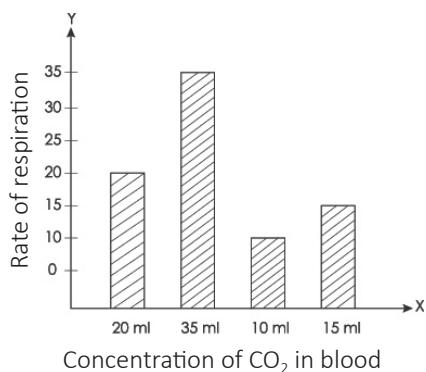
What will be the colour of the indicator in each test tube after two hours?

	I	II	III
a.	Red	Yellow	Red
b.	Yellow	Yellow	Green
c.	Yellow	Red	Red
d.	Yellow	Yellow	Yellow

23. Persistent and violent coughing due to respiratory diseases may destroy lung tissues, resulting in a condition where the total surface area for gaseous exchange in the lungs is reduced. Which of the following is correct for that condition?

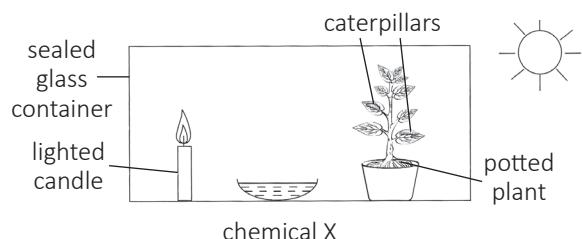
- I. The rate of uptake of carbon dioxide by the blood in the lung capillaries is increased.
- II. The person is likely to breathe more times per minute during physical activities.
- III. More mucus is produced by the epithelial cells of the trachea.
- a. Only I                                  b. Only II  
c. I and II                              d. I and III

24. Read the bar graph shown below and choose the correct option.



- a. With the increase in carbon dioxide in the blood, the rate of respiration also increases.
- b. With the decrease in carbon dioxide in the blood, the rate of respiration also increases.
- c. Rate of respiration is independent of the concentration of carbon dioxide in the blood.
- d. Concentration of carbon dioxide is variable in the blood.

25. Study the given diagram.



Read the given statements concluded from the set up.

- I. The lighted candle continues to burn
- II. The lighted candle blows off.
- III. X is calcium hydroxide that turns CO<sub>2</sub> milky after a while when it absorbs it.
- IV. X is lime water that turns milky after a while when it absorbs O<sub>2</sub>.

Choose the correct statements.

- a. I & III
- b. II & IV
- c. II & III
- d. I & IV

---

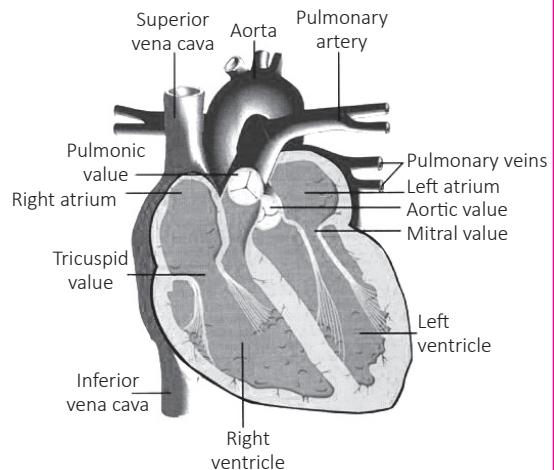
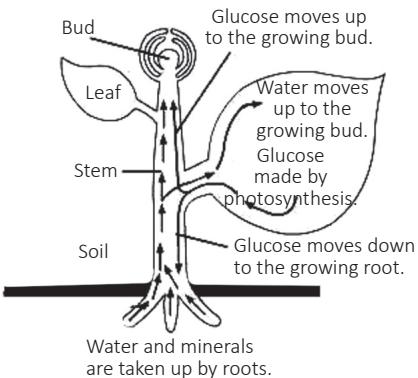
Darken your choice with HB pencil -

1. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	8. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	15. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	22. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d
2. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	9. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	16. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	23. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d
3. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	10. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	17. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	24. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d
4. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	11. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	18. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	25. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d
5. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	12. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	19. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	
6. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	13. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	20. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	
7. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	14. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	21. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d	

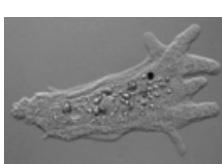
# Transportation in Plants and Animals

→ All organisms need food, water and oxygen for survival. They need to transport all these to various parts of their body.

- Blood is the fluid which flows in the blood vessels. It carries oxygen from the lungs to the cells of the body. It also transports waste for removal from the body.
- The fluid part of blood is called plasma.
- Two types of blood vessels are present in the body. They are arteries and veins. Arteries and veins are joined by a network of capillaries.
- Heart is the main pumping organ for blood to be circulated, as blood is required to be sent to all the parts of the body to carry out all the important functions of the body.
- The number of heart beats per minute is called pulse rate.
- The rhythmic expansion and contraction of the heart is called heartbeat.
- Stomata are tiny pores present on the surface of the leaves. These pores are surrounded by 'guard cells'.



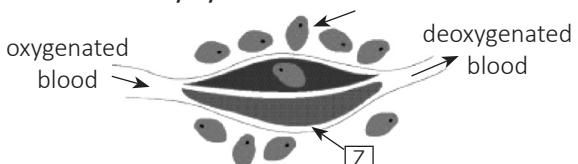
## SECTION - A : SCIENTIFIC REASONING

1. Which of the following does not represent double blood circulation?
    - a. Human being
    - b. Prawn
    - c. Kangaroo
    - d. Cat
  
  2. Valves that direct the flow of blood only in one direction are present in
    - a. Arteries
    - b. Veins
    - c. Capillaries
    - d. Arteries, veins and capillaries
  
  3. X removes the nitrogenous waste present in the blood by filtration. The useful substances are absorbed back into the blood and the wastes dissolved in the blood are filtered out to form Y.  
Here X and Y are:
    - a. X – Kidney      Y – Waste
    - b. X – liver      Y – Urine
    - c. X – Kidney      Y – Urine
    - d. X – Blood      Y – Waste
  
  4. X is a flexible tissue found in the hollow interior of bones. It is considered as the site for the synthesis of red blood cells.  
Identify X.
    - a. Bone marrow
    - b. Capillary
    - c. Cartilage
    - d. Veins
  
  5. Which of the following incorrectly describes the difference between the two organisms shown below?
- 

I.

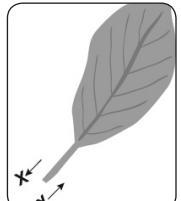


II.
- a. 'I' is a unicellular organism and 'II' is a multicellular organism.
  - b. In 'I', circulation is brought about by the process of diffusion, but in 'II', circulation is brought about by water vascular system.
  - c. In 'I', excretion is done by blood capillaries but in 'II', excretion is done by gills.
  - d. None of these
- 
6. The diagram shows a part of human circulatory system.
 



What could be the part labelled as Z?

    - a. Aorta
    - b. Vena cava
    - c. Capillary
    - d. Artery
  
  7. Look at the given diagram. Which of the following correctly matches the substances carried in the direction of arrows, X and Y?
 



X	Y
a. Sugar	Water
b. Oxygen	Carbon dioxide
c. Water	Sugar
d. Carbon dioxide	Water vapour
  
  8. Which of the following statements is incorrect about transpiration?
    - a. Transpiration always occurs against the gravity.
    - b. Osmotic balance of the cell is maintained by transpiration.
    - c. Transpiration involves mainly the phloem cells which become active during the absorption process by the roots.

- d. Transpiration helps in the distribution of dissolved substances to all the parts of the plant.
9. The transport system of a plant does not require a pump because:
- Transportation of water/mineral salt depends on the constant evaporation of water at the surfaces of leaf cells.
  - Movement of food is one-way, from where they are produced in the leaves to where they are needed.
  - Both a and b
  - None of these
10. Which of the following correctly shows the sequence of mechanism involved in xylem vessel during the transportation of water?
- I. Water enters the root cell by osmosis.
  - II. Water is pulled upward from the roots to the leaves.
  - III. Water entering the root cell creates a pressure which pushes water upward.
- I, II and III
  - II , I and III
  - III, II and I
  - I, II and III and then again II.
11. The given bar chart shows the concentration of carbon dioxide in blood samples taken from four different places in the human circulatory system.
- 
- | Sample | Concentration of carbon dioxide in the blood sample |
|--------|---|
| A      | High  |
| B      | Low   |
| C      | Medium-High   |
| D      | Medium-Low  |
- Identify which blood sample was taken from the pulmonary veins.
- A and B
  - Only B
  - C and D
  - Only D
12. Read the flow chart shown below and answer the following question.  
What could 'Z' represent in the flowchart?
- ```

graph TD
    Start([Start]) --> FoundInStem{Found in stem?}
    FoundInStem -- No --> W[W]
    FoundInStem -- Yes --> FoundInRoots{Found in roots?}
    FoundInRoots -- No --> X[X]
    FoundInRoots -- Yes --> FoundInLeaf{Found in leaf?}
    FoundInLeaf -- No --> TransportFood[Transports food?]
    FoundInLeaf -- Yes --> Y[Y]
    TransportFood -- No --> Z[Z]
    TransportFood -- Yes --> Z
  
```
- Xylem
  - Phloem
  - Root hair
  - Stomata
13. The structure Y in the given diagram has thick muscular wall because :
- 
- I. It prevents back flow of the blood.  
II. It pumps blood at high pressure so that blood can travel to the rest of the body parts.  
III. It allows easier diffusion of blood.
- Only I
  - Only II
  - I and II
  - None of these

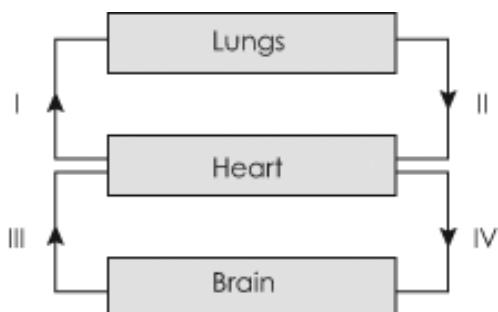
14. The table shown below shows the characteristics of blood in a typical blood vessel.

| Oxygen concentration | Carbon dioxide concentration | Pressure    |
|----------------------|------------------------------|-------------|
| High                 | Low                          | The highest |

Which of the following blood vessels contains blood with these characteristics?

- a. Vena cava
- b. Pulmonary vein
- c. Pulmonary artery
- d. Aorta

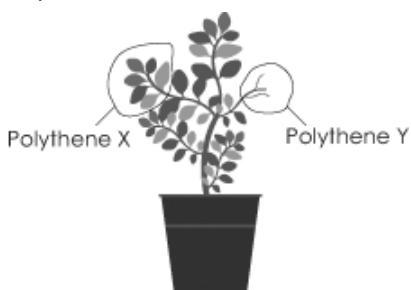
15. The diagram shown here shows simplified human circulatory system. Which blood vessels carry deoxygenated blood?



- a. I and III
- b. I, II and III
- c. II and III
- d. Only I

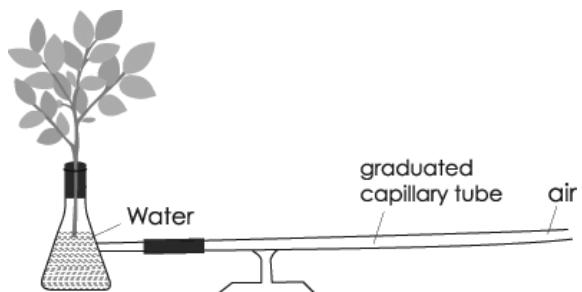
## SECTION - B : EVERYDAY SCIENCE

16. Jiya took a potted, well watered plant and tied polythene X and polythene Y as shown in the given figure. Then, she put the plant in the sun for a few hours. Which of the following shows correct observation of Jiya's experiment?



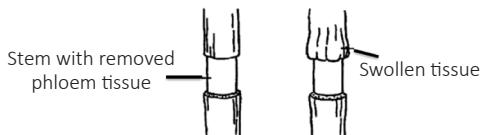
- I. Water droplets are visible in polythene Y as photosynthesis occurs through the leaves.
  - II. Water droplets are visible in polythene X as transpiration occurs through the leaves.
  - III. Water droplets are visible in polythene Y as transpiration occurs through the stem.
  - IV. Water droplets are visible in polythene X as photosynthesis occurs through the leaves.
- a. I and II
  - b. II and IV
  - c. I, II and III
  - d. Only II

17. John sets up an experimental apparatus as shown below. He observes that the column of air moved towards the left.

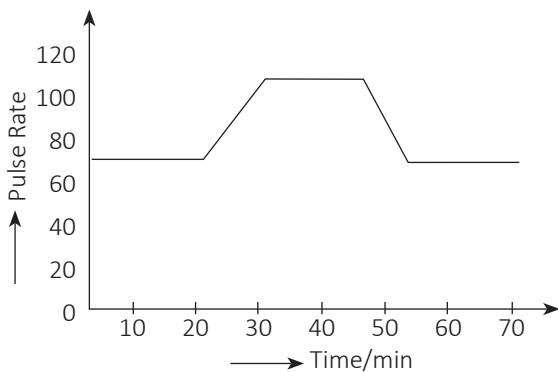


Which of the following statements is correct regarding this?

- a. The plant is sucking water up its vessels.
  - b. The leaves are not able to photosynthesize.
  - c. Water is being pulled up through the stem as the leaves lose water by transpiration.
  - d. Root pressure is pushing water upwards.
18. Zоеi takes the stem of a rose plant and removes its phloem tissue. After three days she notices swelling in the upper part of the stem of rose plant. This is because:



- a. The upward movement of food is getting blocked.
- b. The upward movement of water is getting blocked.
- c. The downward movement of food is getting blocked.
- d. The downward movement of water is getting blocked.
19. Study the given graph showing Kavya's pulse rate over a period of one hour.

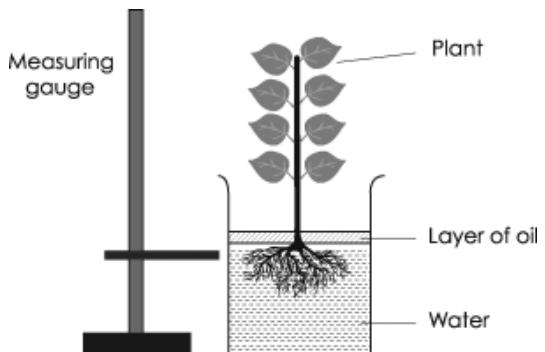


What do you conclude from this graph?

- a. Kavya's pulse rate was 70 beats/minute when she was at rest.

- b. If Kavya had run at the maximum speed of 20 km/h, she would have run for 20 minutes.
- c. Kavya's pulse rate decreases immediately.
- d. Only a. and b. are correct.

20. Observe the diagram shown here and choose the correct option for this.

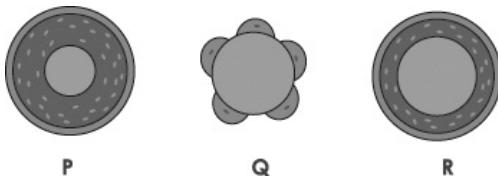


- I. After a week, the water level in the beaker will go down.
- II. Layer of oil is placed to prevent evaporation of water.
- III. Layer of oil is placed to prevent breeding of mosquitoes.

- a. I and II                                    b. II and III  
c. I, II and III                              d. Only I

### SECTION - C : BRAINBOX

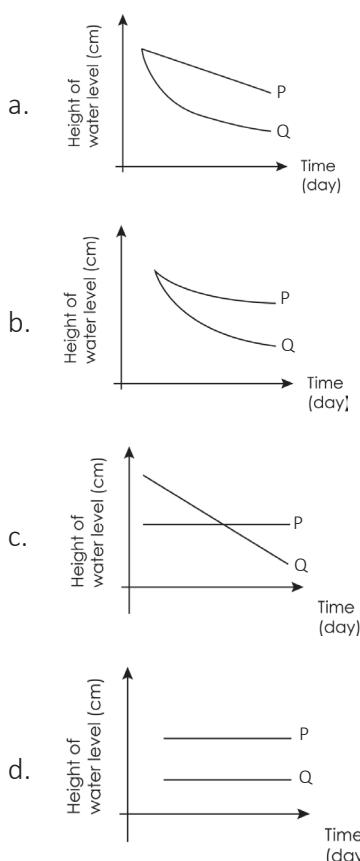
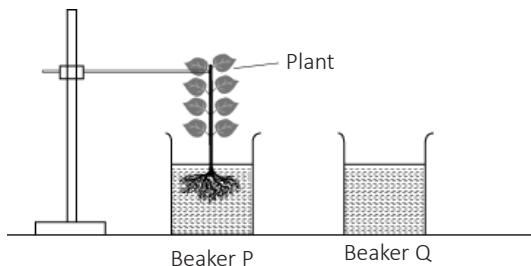
21. The diagrams shown here represents the different types of blood vessels P, Q, and R.



Which of the following features is correct for each vessel?

|    | Requires valve to aid the blood flow | Substances can pass through the wall | Blood under high pressure |
|----|--------------------------------------|--------------------------------------|---------------------------|
| a. | P                                    | Q                                    | R                         |
| b. | R                                    | P                                    | Q                         |
| c. | R                                    | Q                                    | P                         |
| d. | Q                                    | R                                    | P                         |

22. An experiment was set up inside a house as shown in the given diagram. 500 ml of water was poured into beakers P and Q. A small plant was kept in P. The height of the water level in both P and Q was recorded every day for a week. The results were plotted in a graph. Which graph correctly shows the changes in water level in both P and Q?



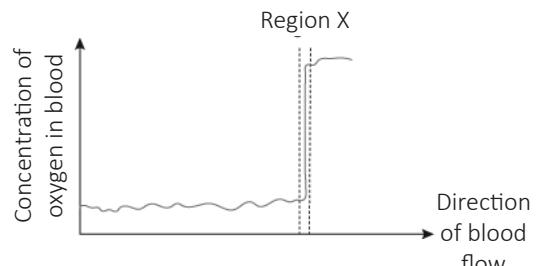
23. The data given here compares some features of different blood vessels, A, B and C, in the human circulatory system.

| Blood vessel | Property                   |                             |
|--------------|----------------------------|-----------------------------|
|              | Average diameter of vessel | Average thickness of vessel |
| A            | 3.5 mm                     | 0.9 mm                      |
| B            | 7.0 $\mu\text{m}$          | 0.8 $\mu\text{m}$           |
| C            | 4.3 mm                     | 0.6 $\mu\text{m}$           |

Which of the following is correct for A, B and C ?

- a. A – artery, B – capillary, C – vein
- b. A – vein, B – capillary, C – vein
- c. A – artery, B – vein, C – capillary
- d. A – vein, B – capillary, C – artery

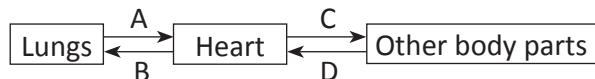
24. The given graph shows the change in the concentration of oxygen when the blood flows in blood vessels.



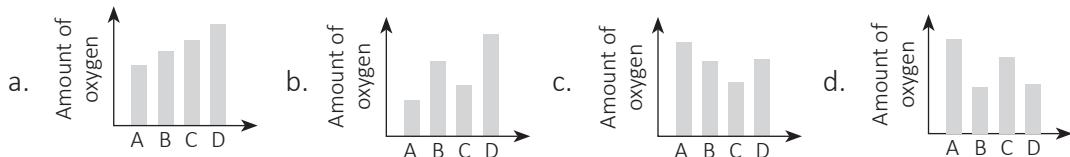
What could most likely have taken place in region X which caused the concentration of oxygen to increase abruptly?

- a. Red blood cells in the blood picked up oxygen from the alveoli when it reached region X.
- b. The body cells in region X returned the excess oxygen to the blood.
- c. The body cells in region X carry out the chemical reactions which produce large quantity of oxygen.
- d. Haemoglobin in the red blood cells lose the ability to carry oxygen abruptly in region X.

25. The diagram below shows how blood is circulated in a human body. Arrows A, B, C and D represent the flow of blood to various parts of the body.



Which one of the following graphs correctly represents the amount of oxygen in A, B, C and D?



Darken your choice with HB pencil -

- |                            |                         |                         |                         |                             |                         |                         |                         |                             |                         |                         |                         |                             |                         |                         |                         |
|----------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|
| 1. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 8. <input type="radio"/> a  | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 15. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 22. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
| 2. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 9. <input type="radio"/> a  | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 16. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 23. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
| 3. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 10. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 17. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 24. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
| 4. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 11. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 18. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 25. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
| 5. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 12. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 19. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |
| 6. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 13. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 20. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |
| 7. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 14. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 21. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |

# Reproduction in Plants

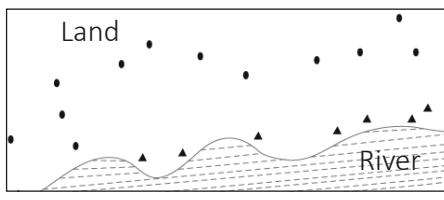
- Reproduction is essential for the continuation of the species from generation to generation.
  - Production of new individuals from the vegetative part of parent plant is called reproduction.
  - There are different methods by which plants reproduce asexually. They are vegetative propagation, budding, fragmentation and spore formation.
  - Modes of reproduction that involves only one parent is called unisexual reproduction.
  - The sexual reproduction in flowering plants involves pollination and fertilization.
  - The vegetative parts of a plant are the roots, the stems and the leaves. When new plants are produced from these parts, the process is called vegetative propagation.
  - The transfer of pollen grains from the anther to the stigma of the same or of another flower of the same kind is known as pollination.

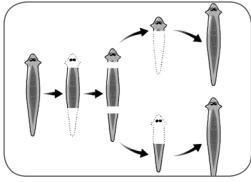


## SECTION - A : SCIENTIFIC REASONING

1. Seeds are dispersed to far-off places by wind, water, birds, animals, etc. The reason for this is to:
  - a. Prevent overcrowding.
  - b. Prevent them from sunlight.
  - c. Prevent them from high temperature.
  - d. Provide them crowded places.

2. The diagram shows a river bank where two types of plants (A and B) are growing. How fruits and seeds of the given plants are most likely to be dispersed?



- |           |                |
|-----------|----------------|
| a. Water  | Wind           |
| b. Wind   | Water          |
| c. Wind   | Wind           |
| d. Animal | Human activity |
3. Identify the mode of reproduction in the organism shown in the figure.
 
4. What is true about a cucumber flower?
  - a. It has neither a filament nor a stigma.
  - b. It has neither an anther nor a stigma.
  - c. It has either male or female reproductive parts.
  - d. It has both male and female reproductive parts.
5. In vegetative propagation, new plants are produced from roots, stems, leaves and buds of the previously existing plants.

These plants –

- a. Can grow without soil.
- b. Are exact copies of the parent plants.
- c. Are different from the parent plants.
- d. Can grow without water.

6. Which of the following is correct about the spores?
  - a. Moss, fern and many micro-organisms like fungi reproduce by spore formation.
  - b. A spore is covered by a hard protective coat to withstand unfavourable conditions for a long time.
  - c. When favourable conditions come, the spore germinates and develops into a new individual.
  - d. All of these

7. Style ends into the topmost part of a flower called X. Pollen grains are received on this X part of the flower.

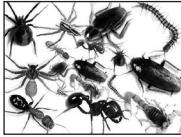
Here X is:

- |           |           |
|-----------|-----------|
| a. Pistil | b. Stigma |
| c. Style  | d. Ovary  |

8. Which of the following shows advantage(s) of self-pollination?

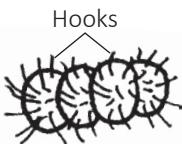
- I. New species are not produced in self-pollination.
- II. Plants that are self-pollinating spend less energy in the production of pollinator attractants.
- III. New characters are not introduced.
- IV. Characters that are undesirable cannot be eliminated.

- a. I and II
- b. III and IV
- c. Only II
- d. None of these

9. X is the type of plant produced by open pollination. Y is the plant produced by pollination performed by vertebrates like birds and bats. Identify X and Y here.
- X- Heirloom tomatoes      Y- Acaena
  - X- Potatoes      Y- Gallium aparine
  - X- Acaena      Y- Gallium aparine
  - X- Acaena      Y- Heirloom tomatoes
10. Which of the following is correct for the flowers which ensure that their pollination is done by birds?
- These flowers are typically brightly coloured, often red or orange.
  - These flowers produce large quantities of thin, watery nectar.
  - These flowers are scentless because most birds do not respond well to smell.
  - All of these
11. Which of the following represents ornithophily pollinator?
- 
  - 
  - 
  - 
12. Which of the following statement(s) is/are correct about the animal shown in the given figure?
- Pollination of plants by this animal is called malacophily.
  - This animal performs pollination in cobra plant, arisaema and some arum bulbs.
  - This animal performs pollination in aloe vera plant.
- 
13. Four stem cuttings were obtained from a jasmine plant which gave rise to four healthy plants. All the four new plants are correctly considered as clones. This is because
- Jasmine undergoes vegetative propagation.
  - All the individuals produced, as a result are, genetically identical.
  - Both a. and b.
  - None of these
14. Which of the following represents an incorrect match?
- Anemophily : Wind
  - Hydrophily : Water
  - Entomophily : Insect
  - Malacophily : Turtle
15. Which of the following is incorrect about the process shown here?
- 
- In asexual reproduction, this process is involved is mitosis.
  - In sexual reproduction, this process is involved is reductional division.
  - It is not involved in asexual reproduction.
  - It is the process by which a parent cell divides into two or more daughter cells.

## SECTION - B : EVERYDAY SCIENCE

16. The diagram here shows the fruit of a certain plant.



Based on the diagram which of the following statements about the hooks of the fruits is correct?

- The hooks tear open the fruit when it is ripe, dispersing the seeds around the parent plant.
- The hooks attract animals to eat the fruit and disperse the seeds further away from the parent plant.
- The hooks increase the surface area of the fruit, allowing the wind to carry the fruit further away from the parent plant.
- The hooks enable the fruit to stick onto the fur of the animals, enabling the fruit to be carried further away from the parent plant.

17. Mary collected four flowers from her garden. She recorded her observations of the flowers in the table below:

| Flower | Size of the petal | Colour of the petal | Smell     |
|--------|-------------------|---------------------|-----------|
| A      | Large             | White               | Scented   |
| B      | Small             | White               | Unscented |
| C      | Large             | Bright red          | Scented   |
| D      | Small             | Bright yellow       | Unscented |

Which flower is least likely to be pollinated by insects?

- Flower A
  - Flower B
  - Flower C
  - Flower D
18. Vaibhavi was strolling in the park when she observed a certain type of small white flowers growing along the sides of the pavement. The diagram below shows how the flower looked like.

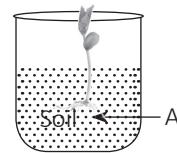
Vaibhavi suspected that the flower was pollinated by wind. She also noticed that part X of the flower was hanging outside its petals.



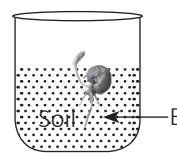
Vaibhavi was told that if part X of the flower did not hang out of its petals, the flower could not be pollinated. What could be the possible reason?

- Part 'X' produces anther.
- Part 'X' can be blown by wind to reach the stigma and pollinate the flower.
- Vaibhavi was told incorrectly.
- Both a and b

19. Two groups of grade 7 students germinated bean seeds in a dish containing moist cotton wool. In 3 to 4 days, the beans germinated and the root and shoot appeared. Students of group 1 carefully removed the seed leaves of one seed and planted the seedling in a pot of soil. Students of group 2 planted other seedling in another similar pot of soil, as shown here.



Set up done by Group 1.



Set up done by Group 2.

What will happen to both the seedlings after 10 days?

- Seedling A will grow but seedling B will die due to lack of nutrition.
- Both seedlings A & B will grow.
- Seedling B will grow but seedling A will die due to lack of nutrition.
- Growth of seedlings cannot be determined with the help of the given information.

20. Sunil observed a peepal tree growing on a mango tree as shown here.

What do you conclude from this?

- Some birds eat peepal fruits with seeds and pass out undigested seeds through their droppings.
- Animals help in the dispersion of seeds.
- Droppings provide warmth required for seed germination.
- All of these are correct.

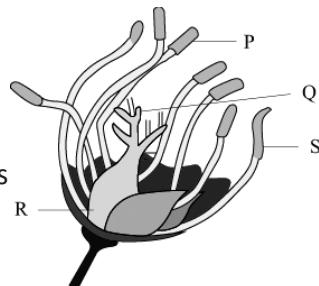


### SECTION - C : BRAINBOX

21. How insect-pollinated flowers are adapted for pollination?

- I. The stamens hang out of the flower, exposing the anthers to the wind.
  - II. The flower has a sweet scent.
  - III. The flower petals are brightly-coloured.
  - IV. The pollen grains are tiny and light.
- 
- Only I
  - II and III
  - I, II and III
  - Only IV

22. Look at the diagram of a common grass flower. Which structure contains the pollen grains and the ovules?



|    | Pollen grain contained in | Ovules contained in |
|----|---------------------------|---------------------|
| a. | P                         | Q                   |
| b. | P                         | R                   |
| c. | R                         | S                   |
| d. | R                         | P                   |

23. The given table lists some plants and their reproductive structures. Choose the correct option to be placed at X and Y.

| Plants | Reproductive structures |
|--------|-------------------------|
| X      | Seeds                   |
| Moss   | Spores                  |
| Onion  | Y                       |

- X- Pineapple      Y- Root
- X- Bean plants      Y- Underground stem
- X- Drumstick      Y- Underground stem
- X- Bryophyllum      Y- Leaves

24. Identify X, Y and Z among the following.

| Seeds     | Dispersed by |
|-----------|--------------|
| X         | Water        |
| Drumstick | Y            |
| Maple     | Wind         |
| Z         | Animals      |

- | X          | Y       | Z          |
|------------|---------|------------|
| a. Mango   | Water   | Drumstick  |
| b. Coconut | Wind    | Xanthium   |
| c. Coconut | Animals | Drumstick  |
| d. Mango   | Wind    | Blackberry |

25. Which of the following is incorrect about the given diagram?

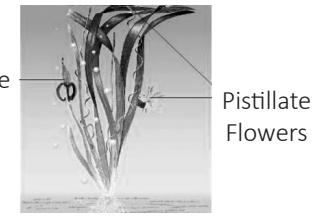
- I. This type of pollination occurs in water plant.
- II. The plants release pollens directly into the surrounding water medium.
- III. All aquatic plants are pollinated by water only.
- IV. Not all aquatic plants are pollinated by water, most of them bear flowers above the water surface and are pollinated by wind or insects.

a. Only I

b. Only III

c. III and IV

d. II and III



Darken your choice with HB pencil -

1.  a  b  c  d

2.  a  b  c  d

3.  a  b  c  d

4.  a  b  c  d

5.  a  b  c  d

6.  a  b  c  d

7.  a  b  c  d

8.  a  b  c  d

9.  a  b  c  d

10.  a  b  c  d

11.  a  b  c  d

12.  a  b  c  d

13.  a  b  c  d

14.  a  b  c  d

15.  a  b  c  d

16.  a  b  c  d

17.  a  b  c  d

18.  a  b  c  d

19.  a  b  c  d

20.  a  b  c  d

21.  a  b  c  d

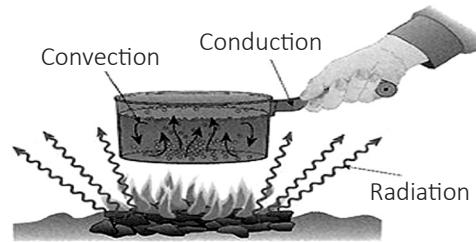
22.  a  b  c  d

23.  a  b  c  d

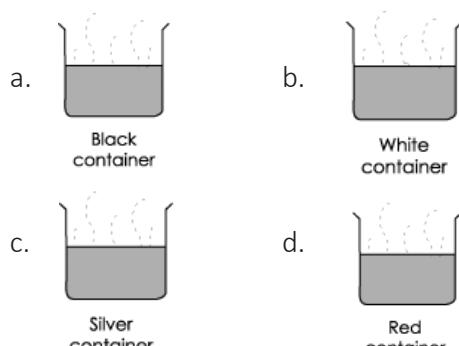
24.  a  b  c  d

25.  a  b  c  d

- Heat is a form of energy, which measures the sensation or perception of warmth or coldness of a body or environment.
- Temperature is the measurement of hotness or coldness of a body.
- When two bodies are placed in contact, heat always flows from the body at a higher temperature to the body at a lower temperature.
- An instrument used to measure the temperature of a body is called a thermometer.
- The normal temperature of human body is  $37^{\circ}\text{C}$ , although the temperature of every person is not  $37^{\circ}\text{C}$ , it may be slightly higher or lower.
- Heat can flow from one object to another by three ways, namely, conduction, convection and radiation.
- In solids, generally heat is transferred by conduction; in liquids and gases, heat is transferred by convection and for transfer of heat by radiation no medium is required.
- The materials which allow heat to pass through them easily are conductors of heat.
- The materials which do not allow heat to pass through them easily are insulators.
- Dark coloured objects absorb radiation more than light coloured objects.
- Woollen clothes keep us warm because wool is a poor conductor of heat and it traps the air in between the fibres.



## SECTION - A : SCIENTIFIC REASONING

1. Find the temperature of the mixture, when one litre of water at  $40^{\circ}\text{C}$  is mixed with one litre of water at  $60^{\circ}\text{C}$ .
  - a.  $100^{\circ}\text{C}$
  - b.  $20^{\circ}\text{C}$
  - c. Between  $40^{\circ}\text{C}$  and  $60^{\circ}\text{C}$
  - d. Greater than  $60^{\circ}\text{C}$
2. What do we call the mode of heat transfer in which a warm material is transported so as to displace a cooler material?
  - a. Radiation
  - b. Conduction
  - c. Convection
  - d. Both a and b
3. Two rods P and Q are placed in boiling water and laid on a table respectively. Rod P does not feel hot but rod Q feels cool when touched. Rods P and Q are made of \_\_\_\_\_.
  - a. Metal and plastic, respectively
  - b. Glass and ceramic, respectively
  - c. Glass and plastic, respectively
  - d. Glass and metal, respectively
4. The given figures show hot water contained in four different containers. Which container will cause the temperature of the water to drop at the fastest rate?
5. The boiling point of water can be increased by \_\_\_\_\_.
  - I. Adding sugar to the water.
  - II. Boiling the water on a high mountain.
  - III. Increasing the pressure in the beaker.
  - IV. Heating the beaker less strongly.
6. If there is a hole in a copper plate, on heating the plate, what happens to its diameter?
  - a. Increases
  - b. Decrease
  - c. First increases and then decreases
  - d. Remains same
7. When two rods made of iron and aluminum represented by P and Q, respectively, are heated to the same temperature, then
  - a. P will expand less.
  - b. P will expand more.
  - c. Both P and Q will expand equally.
  - d. P will not expand at all.
8. The range of a thermometer is  $-10^{\circ}\text{C}$  to  $110^{\circ}\text{C}$ . Which of the following thermometers shows the range as above?
  - a. Digital thermometer
  - b. Clinical thermometer
  - c. Laboratory thermometer
  - d. None of these
9. When a thermometer is placed in hot water, the liquid in the thermometer rises. This is because
  - a. The liquid particles gain energy and move further apart.

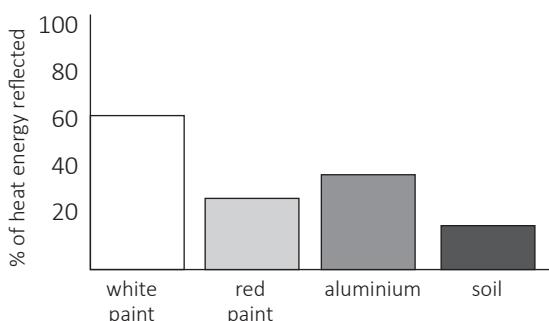
- b. The liquid particles are getting bigger.  
 c. The liquid in the thermometer melts and rises up.  
 d. The internal diameter of the thermometer is getting smaller and this causes the liquid to rise up.
- 10. Convection does not take place in**
- Warming of glass of bulb due to filament.
  - Boiling of water.
  - Sea and land breeze.
  - Heating air around a furnace.
- 11. The balloon rises, when the air inside it is heated.**  
 It is because
- The hot air inside the balloon is attracted to the Sun.
  - Wind blows the balloon upwards.
  - The hot air is less dense than cold air.
  - Outside air is less dense than the hot air inside the balloon.
- 12. A steel tape gives correct measurement at 19°C. The length of a piece of wood is measured with a steel tape at 0°C. The reading is 25 cm on this tape.**  
 The real length must be
- Less than 25 cm
  - 25 cm
  - 26 cm
  - More than 26 cm
- 13. A Celsius and a Fahrenheit thermometers are put in a hot bath tub. The reading on the Fahrenheit thermometer is just three times the reading on the Celsius thermometer. What is the temperature of the bath tub?**
- 52.12°C
  - 13.3°C
  - 9.11°C
  - 26.6°C
- 14. A boy stated that it is hotter at the same distance over the top of a fire than it is on the side. It happens because**
- Heat is radiated upwards.
  - Air conducts heat upwards.
  - Convection takes more heat upwards.
- Only I
  - Only II
  - Only III
  - II and III
- 15. The graph given below shows that the temperature changes in a solid after heating.**  
 For this, mark the correct statement.
- 

- In section PQ, the temperature increase is slower than in section OP.
- The liquid in section QR is absorbing heat without an increase in temperature.
- In section OP, the substance is most able to absorb heat.
- All of these

## SECTION - B : EVERYDAY SCIENCE

- 16. A swimmer climbs out of a swimming pool on a warm, dry day. Almost immediately, he begins to feel cold. Why is it so?**
- The water allows a convection current to remove heat from his skin.
  - The water takes latent heat from his body in order to evaporate.
  - The water on his skin is a good conductor of heat.
  - The water prevents infra-red radiation from reaching his body.

17. The chart shows the percentage of heat energy reflected by different materials.



What is the best way to help keep a house cool in a hot climate?

- Cover the roof with a layer of aluminium.
  - Cover the roof with a layer of red brick.
  - Cover the roof with a layer of soil.
  - Cover the roof with a layer of white paint.
18. Farhan walked barefoot across his paved driveway with no problem on a summer morning. However, later that afternoon, he stepped barefoot onto the same driveway and quickly ran off because the bottoms of his feet felt like they were burning.

Which of the following is correct for reason behind this?

- As the temperature increased during the day, the particles in the pavement moved slower and the thermal energy increased.
- As the temperature increased during the day, the particles in the pavement moved slower and the thermal energy decreased.
- As the temperature increased during the day, the particles in the pavement moved faster and the thermal energy

increased.

- d. As the temperature increased during the day, the particles in the pavement moved faster and the thermal energy decreased.

19. Sheela puts twenty ice cubes of the same volume into four containers packed with different materials. She recorded the time taken for the ice to melt in each case. The table shows her results. Which of the boxes should she choose to carry ice that she needs to take to a friend's house 120 km away?

|    |                          |                           |
|----|--------------------------|---------------------------|
| a. | Container with thermocol | Melting time : 3 h 10 min |
| b. | Container with ice paper | Melting time : 2 h 05 min |
| c. | Container with sand      | Melting time : 30 min     |
| d. | Container with sawdust   | Melting time : 1 h 15 min |

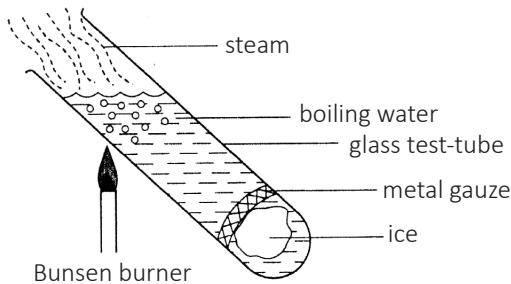
20. Radha had two metal cans P and Q of equal size. She filled both cans with same amount of water at 100°C. She wrapped Can P in cotton wool. After 10 minutes, which can would have higher temperature and why?
- Q, because the metal can is a good absorber of heat.
  - P, because cotton wool is a good reflector of heat.
  - Q, because metal can is a good conductor of heat.
  - Both the cans will have the same temperature.

## SECTION - C : BRAINBOX

21. Container P and container Q are filled with equal amounts of hot water and the temperatures of the water in the containers are measured with a thermometer some time later. It is observed that container P has a much lower temperature than container Q. What are the possible reasons for this?

- I. Container P is black and container Q is silver.
- II. Container P has a lid and container Q is not covered.
- III. Container P is made of steel and container Q is made of clay.
- a. I and II only
- b. I and III only
- c. II and III only
- d. I, II and III

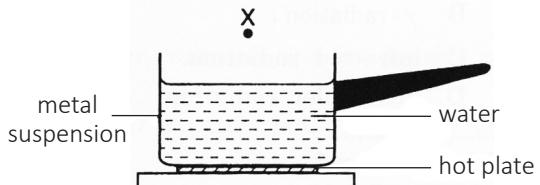
22. An experiment is carried out as shown.



Why does the ice take a long time to melt, even though the water at the top of the test-tube is boiling?

- a. Convection cannot occur in water.
- b. Ice is a poor radiator of heat.
- c. The metal gauze prevents energy reaching the ice.
- d. Water is a poor conductor of heat.

23. The diagram shows a metal saucepan containing water and placed on a hot plate. After some time, the air at point X also becomes hot.

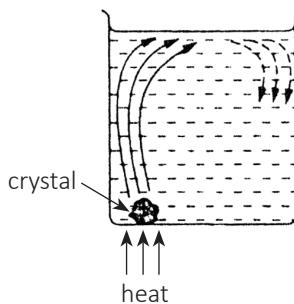


What are the main ways by which heat travels from the hot plate through the base of the metal saucepan, through the water and through the air to point X?

|    | through the base of the saucepan | through the water | through the air |
|----|----------------------------------|-------------------|-----------------|
| a. | conduction                       | convection        | convection      |
| b. | conduction                       | radiation         | convection      |
| c. | convection                       | convection        | conduction      |
| d. | radiation                        | convection        | conduction      |

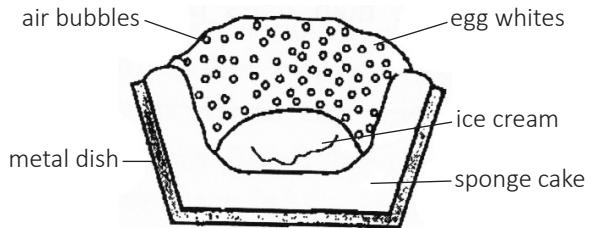
24. The diagram shows a crystal being heated in a beaker filled with water. The crystal releases a dye which shows how the water circulates around the beaker.

What is happening to cause the water above the crystal to rise?



- a. The water contracts and its density decreases.
- b. The water contracts and its density increases.
- c. The water expands and its density decreases.
- d. The water expands and its density increases.

25. A cook makes the pudding 'Baked Alaska'.



The pudding is placed in a very hot oven until the top of the egg white turns brown. It is then removed from the oven. Why does the ice cream still stay cold?

- a. Air is a good conductor of heat and conducts the heat away from the ice cream.
- b. Air is a poor conductor of heat and stops the heat from reaching the ice cream.
- c. The metal dish is a good conductor of heat and conducts the heat away from the ice cream.
- d. The metal dish is a poor conductor of heat and stops the heat from reaching the ice cream..

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Darken your choice with HB pencil -

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1.  a  b  c  d  
2.  a  b  c  d  
3.  a  b  c  d  
4.  a  b  c  d  
5.  a  b  c  d  
6.  a  b  c  d  
7.  a  b  c  d

8.  a  b  c  d  
9.  a  b  c  d  
10.  a  b  c  d  
11.  a  b  c  d  
12.  a  b  c  d  
13.  a  b  c  d  
14.  a  b  c  d

15.  a  b  c  d  
16.  a  b  c  d  
17.  a  b  c  d  
18.  a  b  c  d  
19.  a  b  c  d  
20.  a  b  c  d  
21.  a  b  c  d

22.  a  b  c  d  
23.  a  b  c  d  
24.  a  b  c  d  
25.  a  b  c  d

# Acids, Bases and Salts

- Substances that taste sour contain acids and the chemical nature of such substances is acidic.
- Substances which are bitter in taste and feel soapy on touching are bases and the chemical nature of such substances is basic.
- Indicators are used to taste whether a substance is acidic or basic.
- Litmus is the most commonly used natural indicator.
- Substances which are neither acidic nor basic are called neutral.
- An acid and a base neutralise each other and form a salt.
- A salt may be acidic, basic or neutral in nature.
- The reaction between an acid and a base is called neutralisation.

| Indicator        | Colour     | pH range | Colour in acid | Colour in base |
|------------------|------------|----------|----------------|----------------|
| phenolphthalein  | Colourless | 8.2-10   | Colourless     | Pink           |
| Methyl orange    | REd        | 3.2-4.4  | Pink           | Yellow         |
| Litmus           | Blue       | 4.5-8.3  | Red            | Blue           |
| Bromothymol blue | Yellow     | 6-7.6    | Yellow         | Blue           |

Acid-base Indicators come in many types.

## SECTION - A : SCIENTIFIC REASONING

1. Which of the following is incorrect?

| Acid                                         | Base                                                             |
|----------------------------------------------|------------------------------------------------------------------|
| a. Tastes sour                               | Tastes bitter                                                    |
| b. Courses litmus indicator to turn blue     | Courses litmus indicator to turn red                             |
| c. Dissolves active metals                   | Feels slippery on the skin                                       |
| d. Reacts with bases to form water and salts | Reacts with acids to form water and ionic compounds called salts |

2. Match the common indicators and its colour in acid.

| Indicators          | Colour in acid   |
|---------------------|------------------|
| (P) Phenolphthalein | (i) Red          |
| (Q) Blue litmus     | (ii) Pink        |
| (R) Methyl orange   | (iii) colourless |

- a. P- (iii), Q- (i), R- (ii)
- b. P- (ii), Q- (i), R- (iii)
- c. P- (i), Q- (ii), R- (iii)
- d. None of these

3. In the given reaction, which of the following salt is formed?



- a.  $\text{NH}_4\text{NO}_3$
- b.  $(\text{NH}_4)_2\text{SO}_4$
- c.  $(\text{NH}_4)_2\text{S}$
- d.  $(\text{NH}_4)_3\text{PO}_4$

4. Read the following statements and mark the correct option.

- (i) Litmus paper turns blue to red in the solution of acidic salt.
- (ii) Neutral salts have no effect on litmus paper and the colour of litmus remains unchanged in the solution of neutral salt.

- a. Only (i) is true.

- b. Only (ii) is true.

- c. Both (i) and (ii) are true.

- d. Both (i) and (ii) are false.

5. Acidic soil is not good for healthy growth of plants. This type of soil is neutralized by adding:

- a. Ammonium chloride ( $\text{NH}_4\text{Cl}$ ) to the soil.
- b. Calcium oxide ( $\text{CaO}$ ) to the soil.
- c. Sodium chloride ( $\text{NaCl}$ ) to the soil.
- d. Organic matter to the soil.

6. Match the following and choose the correct option for this.

| A (Acids)         | B (Natural sources) |
|-------------------|---------------------|
| P - Citric acid   | (i) Sour milk       |
| Q - Oxalic acid   | (ii) Orange         |
| R - Lactic acid   | (iii) Spinach       |
| S - Tartaric acid | (iv) Tamarind       |

- a. P- (i), Q- (iv), R- (iii), S- (ii)
- b. P- (ii), Q- (iii), R- (i), S- (iv)
- c. P- (iv), Q- (iii), R- (ii), S- (i)
- d. P- (iii), Q- (ii), R- (i), S- (iv)

7. The pain because of the sting of an ant can be reduced by rubbing moist baking soda. This is because

- a. Sting of the ants contains formic acid which is neutralised by base, that is, moist baking soda.
- b. Sting of the ants contains acetic acid which is neutralised by base, that is, moist baking soda.
- c. Sting of the ants contains magnesium hydroxide which is neutralised by base, that is, moist baking soda.
- d. Sting of the ants contains calcium carbonate which is neutralised by base, that is, moist baking soda.

8. Which of the following statements is/are correct?
- China rose is an indicator that turns basic solution green and acidic solution dark pink.
  - China rose is an indicator that turns basic solution dark pink and acidic solution green.
  - Turmeric gives brownish red colour in basic medium and yellow in acidic medium.
- a. I and III                  b. II and III  
 c. I, II and III              d. Only I
9. On adding a few drops of concentrated nitric acid on crushed food and then heating, if the colour turns yellow, this indicates the presence of \_\_\_\_\_ in the food.
- a. Protein                  b. Carbohydrate  
 c. Starch                  d. Vitamin
10. Which of the following statements is incorrect?
- a. Alkalies are water-soluble bases.  
 b. An alkali is a basic ionic salt of alkali metals.  
 c. All bases are alkalies.  
 d. Alkalies are best known for being bases soluble in water.
11.  $\text{NaHCO}_3 + \text{CH}_3\text{COOH} \rightarrow \text{CH}_3\text{COONa} + \text{H}_2\text{O} + \text{CO}_2$   
 Which of the following statements holds true for the above chemical equation?
- a. When a pinch of baking soda is added to vinegar, the gas evolved is carbon dioxide.  
 b. When a pinch of sodium carbonate is added to vinegar, the gas evolved is carbon dioxide.  
 c. When some drops of vinegar are added to baking soda, the gas evolved is oxygen.
- d. When a pinch of baking soda is added to vinegar, the gas evolved is nitrogen.
12. A student is preparing sulphur dioxide gas by reacting copper turnings and sulphuric acid. To find whether the gas is formed, he can bring the:
- Burning match stick near the mouth of the jar.
  - Moist red litmus paper near the mouth of the jar.
  - Moist blue litmus paper near the mouth of the jar.
  - Moist filter paper near the mouth of the jar.
13. The physical state of some elements at room temperature and the types of their oxides are given below. Which of the given elements is possibly a metal?
- | Elements | Physical State | Type of Oxide |
|----------|----------------|---------------|
| a. P     | Gas            | Acidic        |
| b. Q     | Gas            | Basic         |
| c. R     | Solid          | Acidic        |
| d. S     | Solid          | Basic         |
14. When magnesium dissolves in water forming a solution, it changes the colour of the universal indicator to blue. Which of these is true about the reaction?
- a. An alkali is produced.  
 b. An acid is produced.  
 c. A salt is produced.  
 d. A neutral solution is obtained.
15. Which of the properties of alkalis is incorrect?
- a. It has a soapy feel.  
 b. It has a sour taste.  
 c. It can conduct electricity.  
 d. It can undergo neutralisation reaction.

## SECTION - B : EVERYDAY SCIENCE

16. When a white cloth having turmeric stain on it is washed with soap, the stain turns red in colour, this is because
- Soap solution is acidic in nature.
  - Soap solution is neutral.
  - Soap solution is basic in nature.
  - Soap solution is red in colour.
17. Patients suffering from the problem of indigestion are suggested to take milk of magnesia. This is because
- Milk of magnesia contains acids that work with stomach acid and help in the digestion of food.
  - Milk of magnesia contains magnesium hydroxide, a base which neutralizes excess acid in stomach at the time of acidity.
  - Milk of magnesia contains magnesium dioxide, a base which neutralizes excess acid in stomach at the time of acidity.
- Which of the given statements are correct?
- I and II
  - II and III
  - Only II
  - Only III
18. The following statements show the reason behind tooth decay. Choose the most appropriate reason for the same.
- When we eat food containing sugar, then the bacteria present in our mouth breaks down the sugar to form acid (lactic acid)
  - This acid is strong enough to attack the enamel of our teeth and corrode it.
  - It starts when the pH of the mouth is lower than 5.5.
- a. I and III                    b. II and III  
c. I, II and III                d. Only III
19. Grade 7 students tested the acidic and basic nature of few common substances with different indicators. They created a data table based on their observation.
- | A                             | B                                    | C                              | D                                   |
|-------------------------------|--------------------------------------|--------------------------------|-------------------------------------|
| Turned methyl orange 'Yellow' | Turned Phenol-phthalein 'Colourless' | No change with Red/Blue Litmus | Turned China Rose indicator 'Green' |
- Identify substances A, B, C & D.
- |    | A          | B              | C              | D                |
|----|------------|----------------|----------------|------------------|
| a. | Vinegar    | Fermented milk | NaCl solution  | Milk of magnesia |
| b. | Lime water | Lemon juice    | Sugar solution | Saliva           |
| c. | Saliva     | Lemon juice    | Sugar solution | Lime water       |
| d. | Vinegar    | Apple juice    | NaCl solution  | Lime water       |
20. While preparing the mixture to bake a cake or *dhokla*, bakers use baking powder instead of baking soda. Why?
- Baking powder makes the cake/*dhokla* more fluffy.
  - Baking powder produces more gas as compared to baking soda.
  - Baking powder is a mixture of baking soda and tartaric acid, which makes the cake and dhokla more tasty.
  - Both a and b

## SECTION - C : BRAINBOX

21. Our mouth contains saliva which is a weak alkali. When sweets containing sugar are eaten, bacteria in the mouth change the sugar into acids.
- Which of the following statements best describes how the acidity in mouth changes during and after eating chocolates?
- The pH of mouth increases after eating.
  - The pH of mouth decreases after eating.

- c. No change in the pH of our mouth.  
 d. Eating chocolates does not affect the acidity of mouth but the pH of our mouth changes.
22. There are many substances we use in our regular routine which contain acids or bases. Some of them are given below along with the acid or base they contain. Choose the one which is incorrect.
- | Substances we use | Name of acid/base         |
|-------------------|---------------------------|
| a. Window cleaner | Ammonium hydroxide (Base) |
| b. Grapes         | Citric acid (Acid)        |
| c. Soaps          | Sodium hydroxide (Base)   |
| d. Spinach        | Oxalic acid (Acid)        |
23. A student added dilute hydrochloric acid to a test tube containing zinc granules and made the following observations.
- I. The surface of zinc becomes black.
  - II. A gas evolved which burnt with a pop sound.
  - III. The solution remains colourless.
- The correct observations are
- a. I & II                                                  b. I & III  
 c. II & III                                                d. I, II & III
24. A student used a household material 'X' to write a secret message. He told his friend to spray a liquid 'Y' on paper to read his message.
- What could be the substance X & Y?
- X – Lemon Juice, Y – Turmeric solution
  - X – Baking Soda, Y – Turmeric solution
  - X – Turmeric solution, Y – Water
  - X – Vinegar, Y – Lemon Juice
25. Observe the given experimental set ups.
- 

Grade 7 students concluded the following statements about the set ups P, Q, R & S. Choose the correct one.

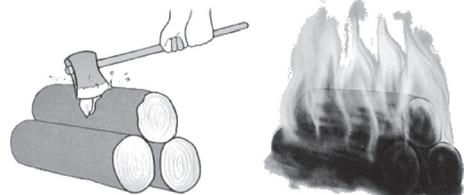
- Turmeric solution turns red in P & R.
- China rose indicator turns magenta in Q & S.
- Methyl orange turns yellow in P & R.
- All are correct

Darken your choice with HB pencil -

- |                            |                         |                         |                         |                             |                         |                         |                         |                             |                         |                         |                         |                             |                         |                         |                         |
|----------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|
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| 5. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 12. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 19. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |
| 6. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 13. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 20. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |
| 7. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 14. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 21. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |

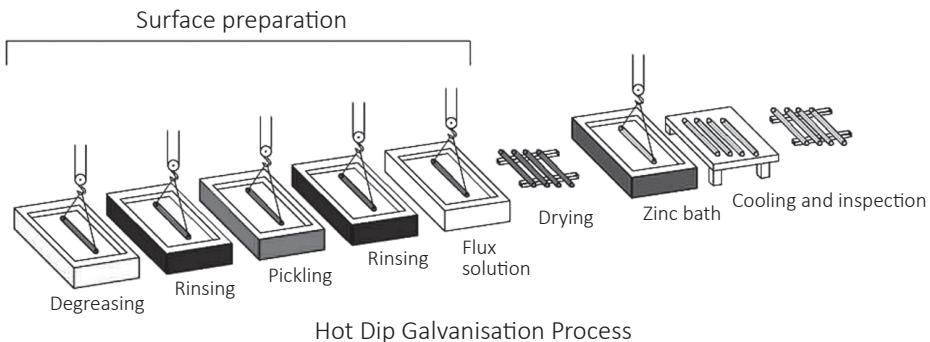
# Changes Around Us

- Changes are all around us. Some changes are chemical and some are physical.
- Physical changes refer to the change in the physical properties of substances. They are generally reversible and are temporary in nature.
- Chemical changes refers to the change in the chemical properties of substances. They are generally permanent in nature and involve formation of a new substance.
- Some changes are useful while some are harmful and cause wastage of materials.
- If articles made of iron are left in open air for some time, they get coated with a brown powdery substance, called rust. This process of iron changing into rust is called rusting.
- The process of deposition of a layer of zinc on iron is called galvanisation.
- Some substances can be obtained in pure state from their solutions by crystallisation.



Physical change

Chemical change



## SECTION - A : SCIENTIFIC REASONING

1. Which of the following always accompanies a chemical change?
  - a. The production of sound.
  - b. The production of light.
  - c. The production of gas.
  - d. The production of a new product.
2. When magnesium ribbon is burnt in air, it produces:
  - a. Magnesium hydroxide  $[Mg(OH)_2]$
  - b. Magnesium oxide  $[MgO]$
  - c. Magnesium sulphide  $[MgS]$
  - d. Magnesium sulphate  $[MgSO_4]$
3. The rate of rusting of iron objects is faster in coastal areas than in the deserts because of the:
  - a. Presence of lesser moisture in air.
  - b. Presence of slow current of air.
  - c. Presence of more moisture in air.
  - d. Presence of fast current of air.
4. Formation of cloud is a physical process because
  - a. Clouds are formed by the precipitation of water vapour present in the atmosphere.
  - b. Clouds are formed by the condensation of water vapour present in the atmosphere.
  - c. Clouds are formed by exchange of ions.
  - d. Clouds are formed by evaporation of water from water bodies.
5. Dilute sulphuric acid is used instead of concentrated sulphuric acid for extracting copper sulphate crystals from copper sulphate solution because
  - a. Concentrated sulphuric acid is corrosive in nature.
  - b. Large crystals of copper sulphate are obtained with dilute sulphuric acid.
  - c. Concentrated sulphuric acid is ineffective.
  - d. Dilute sulphuric acid is cheaper.
6. The rate of evaporation is fastest when the air is
  - a. Dry and still      b. Humid and windy
  - c. Humid and still    d. Dry and windy
7. What happens when an iron nail is dipped in blue coloured copper sulphate solution?
  - I. The colour of the solution becomes dirty green.
  - II. The iron being more reactive displaces copper from its solution and forms ferrous sulphate solution.
  - III. Copper sulphate + Iron  $\rightarrow$  Iron sulphate + Copper

Which of the given statements are correct?

  - a. Only I & III      b. Only II
  - c. Only I & II      d. All of these
8. Which of the following statements is/are correct?
  - I. Galvanisation is done by plating a layer of zinc metal on iron objects by dipping iron into molten zinc.
  - II. In this process, a thin layer of zinc metal is formed on the upper surface of the iron object.
  - III. This process prevents an iron object from corrosion.
  - a. Only I      b. Only II
  - c. Only III      d. All are correct
9. The formation of ozone layer in the atmosphere is a chemical change because:
  - a. The properties of ozone molecule are entirely different from oxygen atom and molecule.

- b. The properties of ozone molecule are similar to that of oxygen atom and molecule.
- c. Oxygen molecule + Oxygen atom = Ozone molecule.
- d. Both a and c
10. Fraction of a ship's iron is replaced every year because it:
- Becomes essential to replace the parts of ship, which are damaged by rusting.
  - Increases the carrying capacity of ship.
  - Makes the ship heavier.
  - Gives new look to the ship.
11. Identify the useful changes among the following.
- The formation of curd from milk.
  - The decay of cow dung and leaves to form manure.
  - A forest fire.
  - Food getting spoilt.
  - Healing of a wound.
- I and II
  - III, IV and V
  - I, II and V
  - II, III and IV
12. Choose the correct statement among the following.
- Crystallization is a chemical change.
  - Digestion of food is a chemical change.
  - Burning of paper is a temporary change.
  - A reversible change is always chemical.
13. Burning of wood and cutting it into small pieces are considered as two different types of changes because:
- Burning of wood produces ash and smoke. So, the properties of wood
- are changed and new substances are formed.
- II. When wood is cut into small pieces, there is no new substance formed. Each small piece has the properties of wood.
- III. When wood is cut, it changes its chemical property.
- Which of the given statements are correct?
- Only III
  - I, II and III
  - Both I and II
  - Only II
14. Read the examples of types of changes given here
- Drawing aluminium into wires.
  - Breaking of a glass.
  - Heating an iron rod till it is red hot.
  - Inflating a ball.
- Which of the following statements are correct about these changes?
- I and II are chemical changes while III and IV are physical changes.
  - II and III are chemical changes while I and IV are physical changes.
  - All are chemical changes.
  - All are physical changes.
15. Which of the following chemical terms correctly describes the change of potassium chloride into potassium and chlorine gas by using electricity?
- Electrolysis
  - Thermal decomposition
  - Oxidation
  - Combination

## SECTION - B : EVERYDAY SCIENCE

16. Riya conducted an experiment to make pure salt from rock salt. She took two spatulas of rock salt and grinded it into fine powder with the help of pestle and mortar. Then she poured the powder into a beaker containing 50 ml of water, mixing it properly with a spatula. After that she filtered the mixture into a clean beaker. Then she put the filtrate into an evaporating basin and heated it over a blue flame. She was left with pure salt.

What all processes are involved in the above experiment done by Riya?

- |                 |                   |
|-----------------|-------------------|
| I. Evaporation  | II. Condensation  |
| III. Filtration | IV. Sedimentation |
| a. I and III    | b. III and IV     |
| c. II and III   | d. I and II       |

17. Cement lying at a construction site in the open gets wet because of rain and turns into a hard substance. Then it was kept under the Sun for few hours. What kind of change would occur in the cement because of rain and sun?

- a. Chemical change
- b. Irreversible change
- c. Harmful change
- d. All of these

18. Anushka forgets a metal spoon in the jar of mango pickle for more than a month. She observed a deterioration in the metal spoon as there were holes in the spoon. What could be the possible reason?

- a. Oil present in the pickle dissolves metal.
- b. Oil present in the pickle liberates a gas which dissolves metal.

- c. Pickle contains acids and metal reacts with acids to form salt and gas.
- d. Both b and c

19. A blacksmith heats the metal rim to fix it onto a cart wheel. Why does he heat the rim?

- a. Heating of the rim is a reversible change.
- b. On heating, the rim expands and fits onto the wheel.
- c. After placing the rim on to the wheel, the rim contracts (on cooling) and fits tightly on to the wheel.
- d. All of these

20. Reshu's mother had some metallic coins in her locker, wrapped in a cloth piece. When she opened to use those coins on a special occasion, she noticed some changes.



Which of the following is not a correct explanation?

- a. Green patches on copper coins are due to formation of copper hydroxide and copper carbonate.
- b. Silver coins lose their shiny appearance due to the formation of silver oxide
- c. The coins get corroded.
- d. Tarnishing of silver coins occurs when silver metal reacts with hydrogen sulphide or sulphur present in the air.

## SECTION - C : BRAINBOX

21. Why crystallization is a better technique than evaporation for recovering sugar from sugar solution?

- a. Some solids like sugar decompose or get charred on heating during evaporation.

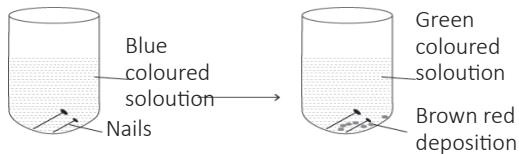
- b. Some solids like sugar associate together on heating during evaporation.
- c. Some solids like sugar disappear on heating during evaporation.
- d. All of these

22. Jiya took few wire pieces made of different metals (as shown in the figure) and placed them in blue solution of copper sulphate. What will be the changes in the colour of the solutions present in beakers I, II and III?

|     | Gold     | Silver | Iron  |
|-----|----------|--------|-------|
| I   | a. Green | Green  | Green |
| II  | b. Blue  | Green  | Green |
| III | c. Blue  | Blue   | Green |
|     | d. Blue  | Green  | Blue  |

23. Study the diagram shown below carefully and answer the following question.

Which of the following reactions explains the above change correctly?



- a.  $\text{ZnSO}_4 + \text{Cu} \rightarrow \text{CuSO}_4 + \text{Zn}$
- b.  $\text{CuSO}_4 + \text{Fe} \rightarrow \text{FeSO}_4 + \text{Cu}$
- c.  $\text{FeSO}_4 + \text{Cu} \rightarrow \text{CuSO}_4 + \text{Fe}$
- d.  $\text{CuSO}_4 + \text{Zn} \rightarrow \text{ZnSO}_4 + \text{Zn}$

24. A science teacher asked his students to perform an activity. The steps are:

- Clean the surface of substance 'X' using soap.

Darken your choice with HB pencil

- |                            |                         |                         |                         |                             |                         |                         |                         |                             |                         |                         |                         |                             |                         |                         |                         |
|----------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|
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| 3. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 10. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 17. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 24. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
| 4. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 11. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 18. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 25. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
| 5. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 12. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 19. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |
| 6. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 13. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 20. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |
| 7. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 14. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 21. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |

# Weather, Climate and Adaptations of the Animals to the Climate

- Weather describes the condition of the atmosphere. It might be sunny, hot, windy, cloudy, raining or snowing. The temperature, humidity and other factors are called the elements of weather.
- Climate is the average weather condition, temperature, pressure, precipitation and humidity expected for a certain place. It is based on the average weather experienced over 30 years or more.
- The science of monitoring and studying the atmosphere and predicting weather and climate is called meteorology.
- As we go higher, temperature generally decreases (from the equator to the poles) as the atmosphere becomes less dense. The sea has a moderating effect on the climate. Ocean currents affect the climate of the coastal areas with the onshore winds.
- Animals are adapted to the conditions in which they live. There are physical, behavioural and functional adaptations, which are found in the plants and the animals.

## SECTION - A : SCIENTIFIC REASONING

1. Tina lives in an area near the equator. What type of weather does she experience?
    - a. Scanty rainfall.
    - b. Cold climate.
    - c. Hot days and cold nights.
    - d. Hot and wet climate.
  2. Mouse in the desert uses hopping movement because:
    - a. It helps to run fast.
    - b. It is used to reduce heat burns.
    - c. It helps to avoid predators.
    - d. It is enjoyable.
  3. One of the adaptations shown by the red eyed frog to overcome intense competition in the tropical rainforest is:
    - a. Long and sticky tongue.
    - b. Long and grasping feet.
    - c. Coloured body.
    - d. Sticky pads on its feet.
  4. Which of the following statements is incorrect about the polar bears?
    - a. They are able to close nostrils and remain under water for long duration.
    - b. They are good swimmers because their paws are wide and large.
    - c. Polar bears have a layer of fat under their skin which helps to insulate the body from the cold and keep it warm.
    - d. In polar bears, the salt is excreted in the form of a concentrated fluid from the nasal passage.
  5. What is the purpose of long beak of the bird, shown in the given figure?
  - a. To hold weak branches.
  - b. To enable it to reach the fruits on weak branches.
  - c. Give attractive look.
  - d. Camouflage itself from the surroundings.
6. The body part, 'X' of an elephant, which is shown in the given figure helps in:
    - a. Having a strong sense of smell.
    - b. Chewing food.
    - c. Having a strong sense of hearing.
    - d. Providing support while walking.
  7. Which of the following statements is incorrect?
    - a. Ocean currents affect the climate of the coastal areas with the onshore winds.
    - b. Pressure and wind system: they depend on the latitude and altitude of a place, thus influencing the rainfall patterns.
    - c. As we go higher, temperature generally decreases (from the equator to the poles) as the atmosphere becomes less dense.
    - d. The sea has no effect on the climate of a place.
  8. Which of the following represents an incorrect classification? (P is for physical adaptation, B is for behavioural adaptation, F is for functional adaptation).
    - I. Webbed feet-P
    - II. Sharp Claws-P
    - III. Hibernation-P
    - IV. Digestive enzyme-F
    - V. Mating-F
    - VI. Feathers-B
    - VII. Rapid growth cycles of plant -F
    - a. III, V and VI
    - b. I, II, III and IV
    - c. III, V and VII
    - d. Only V

9. The instrument shown in the given figure is used by a \_\_\_\_\_.

- I. Metrologist
  - II. Hydrologist
  - III. Astronaut
  - IV. Journalist
- a. I, II and IV
  - b. II and III
  - c. I and II
  - d. Only I



10. Which of the following statements is incorrect about the adaptation of organism throughout different biomes on the Earth?

- a. Trees in the forest, especially rainforests and temperate forests, tend to grow higher to fight for sunlight.
- b. Plants living in dry areas have spine-like leaves to reduce water loss.
- c. Animals in temperate areas hibernate during winter to hide from their predators.
- d. Trees lose their leaves during autumn-winter season to reduce water loss during cold season.

11. The organism shown in the given

figure has flattened body shape. This characteristic helps the organism to:



- a. Fly high in the air.
- b. Crawl between crevices and spaces easily.
- c. Survive for a long period of time without food and water.
- d. Hibernate itself.

12. Organism in a particular environment has special teeth structure, feet, body shape and body coverings. These adaptations are called:

- a. Ornamental adaptation
- b. Structural adaptation
- c. Behavioural adaptation
- d. Functional adaptation

13. Rainforests are habitat to enormous number and variety of plants and animals because:

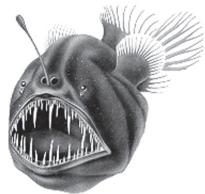
- a. Temperature is generally between 45°C and 60°C for the most part of the year.
- b. Rainfall is rare.
- c. Continuous rain and warmth are available.
- d. They are near the seas.

14. What is the reason behind the humid climatic condition of the coastal region?

- a. Heat and moisture
- b. Heavy rainfall
- c. Less rainfall
- d. Both a and c

15. Study the given diagram of angler fish. It lives deep in the ocean. Its head has a long fin with a glowing tip. This structural adaptation helps this fish to \_\_\_\_\_.

- a. Attract its prey
- b. Breathe in oxygen
- c. Move backwards
- d. Move faster through water



## SECTION - B : EVERYDAY SCIENCE

16. Three species of lizards X, Y and Z, adapted differently, are found in a forest. A predator who feeds on all the three lizards X, Y and Z is introduced into the forest. Which of these lizards will be least affected?

- a. Lizard X because it lives on trees.
- b. Lizard Y because it lives on grounds.
- c. Lizard Z because it shows camouflage.
- d. All the three lizards will be equally affected.

17. The typical desert climate is hot and dry because:
- Deserts receive very little rainfall.
  - The winters last only for a few months in the deserts.
  - Temperature in a desert is very high during most of the months of a year.
- a. I and II                          b. II and III  
c. I, II and III                      d. Only I

18. What is true about the animal shown in the given figure?
- It contains a layer of fat under its skin which acts as an insulating layer.
  - Fat also stores energy for the difficult season of winters.
  - Fats help it to close nostrils and remain under water for long duration.
- a. I and II                          b. I and III  
c. Only I                            d. Only III

19. The lizard is well adapted to live in human dwellings. Which function of its adaptations is incorrectly described?

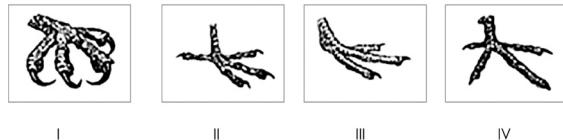


| Adaptation                                      | Function                                            |
|-------------------------------------------------|-----------------------------------------------------|
| Sticky pads on the underside of the feet        | To walk on walls and ceilings without falling down. |
| Long sticky tongue                              | To catch fast moving preys                          |
| Long, narrow and flat body                      | To crawl between narrow crevices and spaces easily  |
| Tail that can drop off and wriggles for a while | To attract mates for reproduction                   |

20. An animal has an inflatable red thick sac. It puffs out like a big balloon and vibrates at times. It also makes clapping noise in its beak and waves its wings. Why does this animal behave in such a way?
- To give warning to its neighbours.
  - To make noisy sound to attract its mate.
  - To light up itself and attract its mate to reproduce.
  - To display its colourful feathers to attract its mate.

### SECTION - C : BRAINBOX

21. The figures below show the feet of four different birds.



Which of the following is correct about the feet and their adaptation in animals?

- To grab the prey.
- To wrap their toes around the branch to hold it.
- To run quickly.
- To scratch in the dirt for insects.

- a. I, II, III and IV                b. III and IV  
c. I and IV                        d. I, III and IV

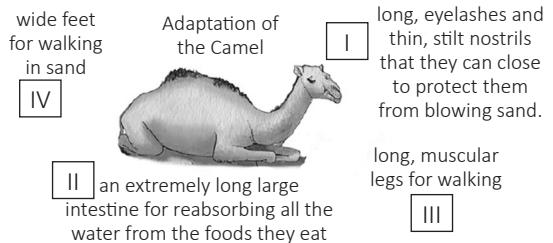
22. Which of the following is/are correct about the habitat of monkeys, birds, snakes, rodents, frogs?
- It lies very close to the equator, between 10°N and 10°S.
  - It has hot and humid climate.
  - The river Amazon flows through this region.
- a. I and III                        b. II and III  
c. I, II and III                    d. Only II

23. Which of the following is incorrect about the changes occurring about the climatic conditions?
- Around 15% of the carbon dioxide released in the environment is due to deforestation and change in the use of land.
  - The global temperature on an average has increased by 0.6 °C to 1°C till the 20th century.
  - Climate change enhances the spread of pests that causes life threatening diseases like dengue, malaria, Lyme disease, etc.
  - Due to the greenhouse effect, the average temperature of the earth is 20°C rather than 10°C without the greenhouse effect.
24. Animal shown in figure I differs from the animal shown in figure II, with regard to the presence of:



- Homeothermy
- Four-chambered heart
- Tracheae
- Diaphragm

25. Which of the adaptation features of camel shown in the given diagram is meant for food storage and getting protection from predators, respectively?



- I and II
- II and III
- III and IV
- Only IV

**Darken your choice with HB pencil -**

- |                                                                                                    |                                                                                                     |                                                                                                     |                                                                                                     |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 1. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 8. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d  | 15. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 22. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 2. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 9. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d  | 16. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 23. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 3. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 10. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 17. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 24. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 4. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 11. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 18. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 25. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
| 5. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 12. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 19. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |                                                                                                     |
| 6. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 13. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 20. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |                                                                                                     |
| 7. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 14. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 21. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |                                                                                                     |

# Winds, Storms and Cyclones

- Air exerts pressure and expands on heating and contracts on cooling.
- Warm air rises up, and comparatively cool air tends to sink towards the earth's surface. When warm air rises up, the air pressure at that place becomes less and the cooler air moves towards that place.
- Air moves from a region of high pressure to a region of low pressure.
- Wind carrying water vapour brings rain. Wind movement is caused because of the uneven heating of the earth's surface.
- The tornadoes are dark funnel-shaped clouds that reach the ground from the sky. Most of them are weak. They may form within the cyclones.
- Cyclones are huge revolving storms caused by winds blowing around a central area of low atmospheric pressure.
- Tracking and monitoring cyclones have improved with technology and communication.
- Self-help is the best help; thus it is better to plan in advance and be ready with defense against any approaching cyclone.

## SECTION - A : SCIENTIFIC REASONING

1. The centre of the cyclone is a calm area called the eye of the storm, which varies from \_\_\_\_\_ in diameter.
  - a. 300 – 400 km
  - b. 3 – 10 km
  - c. 30 – 65 km
  - d. 300 – 400 m
2. Which of the following statements is correct about smoke?
  - a. It always rises upward.
  - b. It always expands to occupy more space and becomes lighter.
  - c. It is heavier than cold air.
  - d. It moves from colder place to hotter place.
3. Which of the following shows the correct reason for the wind current?
  - (i) Uneven heating between the equator and the poles due to the shape of the earth and its inclination.
  - (ii) Even heating between the equator and the poles due to the shape of the earth and its inclination.
  - (iii) Uneven heating of land and water.
  - (iv) Even heating of land and water.
    - a. (ii) & (iii)
    - b. (ii) & (iv)
    - c. (i) and (iii)
    - d. (i) & (iv)
4. Which of the following instruments is used to measure air pressure?
  - a. Thermometer
  - b. Barometer
  - c. Anemometer
  - d. Both a and b
5. Why lightning rods are made of copper?
  - a. Copper rods conduct electricity but do not rust easily.
  - b. Copper rods do not conduct electricity and do not rust.
  - c. Copper rods conduct electricity and have a low density.
  - d. Copper rods do not conduct electricity and have a low density.
6. Direction of winds changes in summers and winters due to:
  - a. Ocean winds
  - b. Uneven heating of the land and water
  - c. Land winds
  - d. Clouds
7. The greater the difference in air pressure, the:
  - a. Slower the water vapour moves.
  - b. Slower the air moves.
  - c. Faster the air moves.
  - d. Greater is the tendency of the air to be still.
8. What is the reason behind convection set up in the air?
  - a. Difference in the temperature in different regions.
  - b. Same temperature in different regions.
  - c. Same air pressure in different regions.
  - d. Difference in constituents of air in different regions.
9. Which of the following statements is/are correct?
  - (i) Cyclone has high speed wind swirling around a high pressure centre.
  - (ii) If raindrops pass through a very hot layer of air, they freeze and come down as hailstone.
  - (iii) When condensation takes place high above the ground, clouds are formed.
    - a. Only (i)
    - b. Only (ii)
    - c. Only (iii)
    - d. All of these
10. Which of the following represents the correct sequence of earth's atmospheric layers from the top to the bottom?
  - a. Exosphere → Thermosphere → Mesosphere → Stratosphere → Troposphere

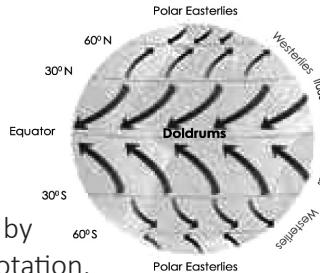
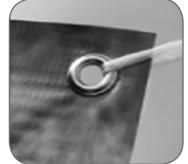
- b. Troposphere → Stratosphere → Mesosphere → Thermosphere → Exosphere
- c. Troposphere → Mesosphere → Thermosphere → Exosphere → Stratosphere
- d. None of these
11. Which of the following statements is incorrect about the effects of cyclone?
- Cause severe loss of life and severe damage to the property.
  - Result in reduced fertility of the soil.
  - Increase the fertility of the soil by bringing in natural fertilizers.
- a. I and II                  b. II and III
- c. Only III                  d. Only II
12. Monsoon winds bring rain because:
- In summer, water in the ocean warms up faster than the land.
  - In summer, the air over the water is warmer than the air above the land, causing the wind to blow from the land towards the oceans.
  - These winds do not carry moisture.
  - These winds carry moisture.
13. Which of the following statements is/are correct?
- I. When the air at a place gets heated by the sun, it expands and becomes lighter.
- II. When air is heated, its volume decreases.
- III. Wind plays an important role in the formation of thunderstorm.
- Only I
  - Only II
  - Both I and II
  - Both I and III
14. Which one of the following safety measures is taken by the authorities to minimise the damage caused by cyclones in coastal areas?
- Cyclone forecast and warning service with slow communication of warnings.
  - Destruction of cyclone shelters in cyclone prone areas.
  - Arrangements to move people to safer places in slow pace.
  - Cyclone forecast and warning service with rapid communication of warnings; arrangements to move people fast to safer places.
15. X is a dark funnel-shaped cloud that reaches the ground from the sky. What is correct about X?
- Most of them are weak.
  - It may form within the cyclones.
  - X with the speed of about 300 km/h is violent in nature.
- Only I
  - Only II
  - I, II and III
  - None of these

## SECTION - B : EVERYDAY SCIENCE

16. You are walking your way back home from school when all of sudden very strong wind accompanied with lightening starts blowing. What all you will do in this situation?
- Take shelter under an isolated tree.
  - Take shelter under an umbrella with a metallic end.
  - Take shelter under metal sheds.
  - Try to take shelter as soon as possible inside a building.
17. Take mouthful of air and close the mouth tightly. Now, press the cheeks with the hands. The air inside mouth puts pressure on it. This shows that:
- Air occupies weight.
  - Air exerts pressure.

- c. Air is everywhere.  
d. We cannot survive without air.
18. Let us boil water in a can covered tightly with a lid. If we pour cold water on it with the lid still tightly attached to it then the can will get distorted. This is because:
- As cold water is poured over the can, some steam in the can condenses into water, reducing the amount of the air inside.
  - The pressure exerted by air inside the can is less than the pressure exerted by the air from outside the can.
  - The can gets compressed.
- a. I and II                          b. I and III  
c. I, II and III                      d. Only III
19. In the given figure the boy is able to row the boat easily because:
- 
- I. When wind is blowing from behind, it will push on the rower and the boat from behind.  
II. This will enhance the speed of the rower and the boat and it is easier to row the boat.  
a. Only I  
b. Only II  
c. Both I and II  
d. Data insufficient to answer the question.
20. By mistake a bicycle tube was over filled and it got burst. This happened because:
- Pressure inside the bicycle tube became more than the atmospheric pressure outside it.
  - The air from inside rushed towards the outside to equalize the atmospheric pressure and in doing so, the tube got burst.
  - The air from the outside rushes towards the inside to equalize the atmospheric pressure and in doing so, the tube got burst.
- a. I and II                          b. I and III  
c. Only I                              d. Only II

### SECTION - C : BRAINBOX

21. Which of the following statements is correct about the diagram?
- 
- a. It is affected by the earth's rotation.  
b. It is unaffected by the earth's rotation.  
c. It is exactly from the north to the south and vice versa.  
d. It is exactly from the east to the west and vice versa.
22. The given figure shows the hanging banner and hole made in it. What is the importance of holes made in the hanging banners?
- 
- I. To prevent the banners from getting torn due to air pressure.  
II. To avoid blowing away of the banner due to air pressure.  
III. To allow passage of air through these holes.  
a. I and II                          b. I, II and III  
c. II and III                        d. Only III

23. 'Lighting is a stream of free flowing electrons.'

Read the statements given about lightning and choose the incorrect one

- It occurs due to the accumulation of charges.
- It starts on the ground and moves upward.
- Lightnings are often caused by an electron discharge between the clouds and the earth.
- Most of the lightnings are because of the positively charged clouds.

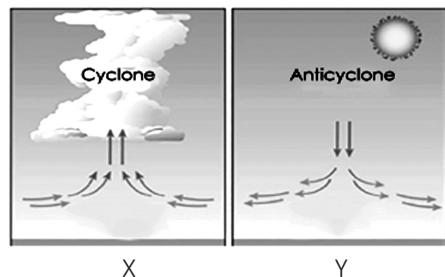
24. A group of students stated some statements about wind and cyclones.

- Warm air is lighter than cool air.
- If wind blows from the land to the ocean, then it is day time.
- The coastline of India is vulnerable to cyclones.
- The coastline of India is not vulnerable to cyclones.

The correct statement(s) are :

- I & III
- II, III & IV
- III & IV
- I & IV

25. Which of the following is correct for X and Y?



- X- Low pressure Y- High pressure
  - X- Converging air Y- Diverging air
  - X- High pressure Y- Low pressure
  - X- Diverging air Y- Converging air
- I and III
  - I and II
  - II and IV
  - I, II and III

Darken your choice with HB pencil -

- a  b  c  d
- a  b  c  d
- a  b  c  d
- a  b  c  d
- a  b  c  d
- a  b  c  d
- a  b  c  d

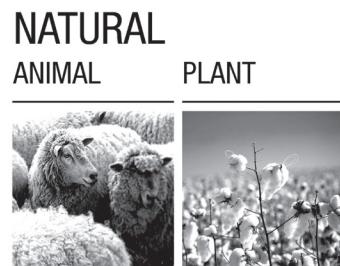
- a  b  c  d
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- a  b  c  d
- a  b  c  d
- a  b  c  d

- We need clothes to wear. Clothing is generally made of cloth. Cloth is also known as fabric. Fabric is made of fibre.

| Types of Fibre                                                           |                                                                          |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Natural                                                                  | Man-made                                                                 |
| Obtained from plants and animals, e.g., - Jute, Cotton, Wool, Silk, etc. | Synthesised in laboratory, e.g., - Terylene, Acrylic, Terry cotton, etc. |



Wool – It is obtained from sheep, goat, yak, etc.

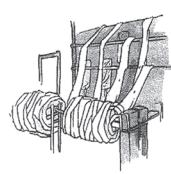
Process to obtain wool from sheep comprises:  
Shearing, Scouring, Sorting, Dyeing, Spinning



Shearing a sheep



Scouring in tanks



Rolling into yarn



Wool



Mulberry silk

Silk – There are a variety of silkworms that produce different types of silk in terms of lustre and texture. For example, Tussar silk, morga silk, kosa silk, etc.

Mulberry silkworm is the most common silkworm.

## SECTION - A : SCIENTIFIC REASONING

1. Which one of the following is not a type of silk?
  - a. Mulberry silk
  - b. Tassar silk
  - c. Mooga silk
  - d. Moth silk
2. Selective breeding is a process of selecting:
  - a. The offsprings with desired properties.
  - b. An area of breeding.
  - c. Fine hair for good quality wool.
  - d. The parents with desired properties.
3. Which of the following animals does not yield wool?
  - a. 
  - b. 
  - c. 
  - d. 
4. Which of the following terms is(are) related to silk production?
  - a. Sericulture
  - b. Moriculture
  - c. Apiculture
  - d. Both a and b
5. Silkworms secrete fibres made of
  - a. Fat
  - b. Cellulose
  - c. Protein
  - d. Nylon
6. Choose the correct statement.
  - a. In India, camels and goats are generally reared for obtaining wool.
  - b. Yak hairs are not used to make woollen fabric.
  - c. In the process of obtaining wool from fleece, sorting is done after scouring.
  - d. The rearing of silkworm is also known as silviculture.
7. Which of the following is incorrect regarding the properties of wool?
  - a. It is an elastic fibre.
  - b. It can absorb moisture.
  - c. It is a good conductor.
  - d. It is self extinguishable.
8. Choose the correct statement(s) about fibres and fabrics.
  - a. Silk is a cellulosic fibre.
  - b. The hair on a sheep's body is called fleece.
  - c. Silk fabric was first developed in China.
  - d. Both b and c
9. The steps for silk production are given as:
  - I. Eggs are warmed to a suitable temperature for the larvae to hatch from the eggs.
  - II. Fibres are taken out from the cocoon.
  - III. After 20–30 days, the caterpillars stop eating and start spinning cocoons.
  - IV. The silkworms are kept in a clean tray along with freshly chopped mulberry leaves.
  - V. Female silkworms lay eggs,
  - VI. Cocoons are kept under the sun or boiled in water.

The correct sequence of these steps is –

  - a. V → I → IV → III → VI → II
  - b. V → IV → III → II → I → VI
  - c. IV → III → VI → V → II → I
  - d. III → IV → II → I → V → VI
10. Choose the correct statement regarding the types of fibres.
  - a. Asbestos is the only naturally occurring long mineral fibre.

- b. Sericin is a gummy substance that holds two strands of fibroin of a silk fibre together.
- c. Hair of wool-yielding animals traps a lot of air.
- d. All are correct
11. Study the given table and find the incorrect match.
- | Column A           | Column B      |
|--------------------|---------------|
| a. Pashmina Shawl  | Kashmiri Goat |
| b. Woollen Carpet  | Camel Wool    |
| c. Baby Blanket    | Camel Wool    |
| d. Woollen Sweater | Sheep Wool    |
12. Mohair, is a silk-like fabric. Which of the following statements are true about it?
- I. It is made from the hair of Angora Goat.
  - II. It is made from a synthetic fibre.
  - III. It is warm in winters and cool in summers.
- IV. It is known as diamond fibre.
- Choose the correct option.
- I & III
  - I, III & IV
  - II, III & IV
  - I & IV
13. The general process that takes place at sheep shearing shed is:
- Removal of fleece.
  - Separating hair of different textures.
  - Washing of sheep fibre to remove grease.
  - Rolling of sheep fibre into yarn.
14. The fleece are combed to remove:
- Bures
  - Dust
  - Low quality hair
  - All of these
15. Choose the incorrect statement.
- Workers in wool industry generally suffer from Sorter's disease.
  - Bakhewal is an Indian breed of sheep.
  - Rayon is a natural fibre.
  - Shearing is usually done in summer season.

## SECTION - B : EVERYDAY SCIENCE

16. Arushi wanted to buy a gift made of animal fibre obtained without killing the animal. Which of the following would be the right gift for her to buy?
- Woollen shawl
  - Silk scarf
  - Animal fur cap
  - Leather jacket
17. Ranjana took a fabric and burnt it. She observed the following properties of the fabric.
- I. It burns but does not melt.
  - II. It shrinks from flame.
  - III. It is self extinguishing.
  - IV. It gives the odour of chased meat while burning.
  - V. It left a black, hollow and irregular bead as residue which can easily be crushed to a gritty black powder.
- What could this fabric be?
- Silk
  - Jute
  - Cotton
  - Nylon
18. Wool industry is an important means of livelihood for many people in our country. But sorters' job is risky as sometimes they get infected by a bacterium, \_\_\_\_\_ .
- Typhi
  - Anthrax
  - Mycobacterium
  - Firmicutes
19. Study the given table. Which one is not matched correctly?
- |    | Name of breed  | Quality of wool |
|----|----------------|-----------------|
| a. | Rampur Bushair | Brown Fleece    |
| b. | Nali           | Carpet Wool     |
| c. | Marwari        | Coarse Wool     |
| d. | Patanwadi      | Coarse Wool     |

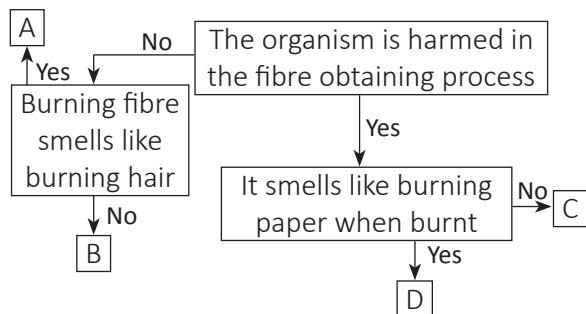
20. Divya, while studying about fibre and fabrics, made 3 groups regarding fibre and its production. She put one wrong member in each group. Find that wrong member.
- Muga, Kosa, Cashmere, Tussar
  - Larva, Pupa, Silkmoth, Tadpole
  - Lohi, Marwari, Patanwadi, Pashmina

Choose the correct option –

- I – Muga, II – Pupa, III – Patanwali
- I – Kosa, II – Tadpole, III – Patanwali
- I – Cashmere, II – Tadpole, III – Pashmina
- I – Tussar, II – Tadpole, III – Lohi

### SECTION - C : BRAINBOX

21. Study the given flow chart and find A, B, C and D.



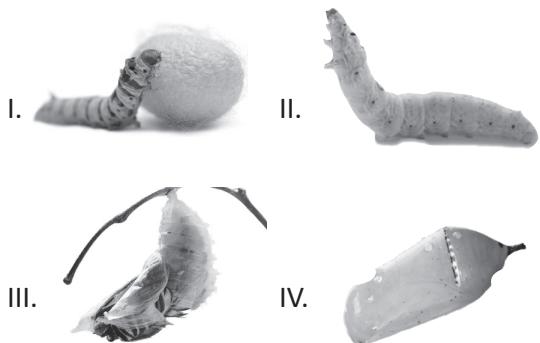
Choose the correct statement about A, B, C and D.

- A is the strongest natural fibre.
  - B is made of protein while C is made up of cellulose.
  - D is obtained from the salivary gland of source organism.
  - C is composed of fibroin and saran.
22. Observe the given diagram. Identify the step involved in processing of wool.



- Scouring in tanks
- Rolling into yarn
- Scouring by machines
- Shearing a sheep

23. Write the caption for each figure given below:



Choose the correct option.

- I – eggs of silkmotth, II – silkworm, III – cocoons, IV – cocoon with moth
- I – silkworm, II – cocoons, III – cocoon with moth, IV – eggs of silkmotth
- I – cocoons, II – eggs of silkmotth, III – silkworm, IV – cocoon with moth
- I – eggs of silkmotth, II – cocoons, III – silkworm, IV – cocoon with moth

24. Read the steps involved in the processing of wool. These are given in a random sequence.

- |               |                    |
|---------------|--------------------|
| I. Scouring   | II. Sorting        |
| III. Sheering | IV. Removing burrs |
| V. Dyeing     | VI. Yarn           |
| VII. Spinning | VIII. Weaving      |
| IX. Fabric    | X. Carding         |

**What is the correct sequence of steps?**

- a. III → I → II → IV → X → V → VII → VI  
→ VIII → IX
- b. II → I → IV → III → X → V → VII → VI  
→ VIII → IX
- c. IX → X → VI → VII → III → V → IV  
→ II → I → VIII
- d. VIII → VII → VI → V → IV → I → II  
→ III → X → IX

**25. Choose the incorrect statement regarding sericulture.**

- a. The silk fibre is obtained from the cocoons by the process of reeling.
- b. After silkworms hatch, they are fed on freshly chopped mango leaves.
- c. If an adult is allowed to emerge out from cocoon, the cocoon becomes useless for silk production.
- d. All of these

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**Darken your choice with HB pencil -**

---

- 1.  a  b  c  d
- 2.  a  b  c  d
- 3.  a  b  c  d
- 4.  a  b  c  d
- 5.  a  b  c  d
- 6.  a  b  c  d
- 7.  a  b  c  d

- 8.  a  b  c  d
- 9.  a  b  c  d
- 10.  a  b  c  d
- 11.  a  b  c  d
- 12.  a  b  c  d
- 13.  a  b  c  d
- 14.  a  b  c  d

- 15.  a  b  c  d
- 16.  a  b  c  d
- 17.  a  b  c  d
- 18.  a  b  c  d
- 19.  a  b  c  d
- 20.  a  b  c  d
- 21.  a  b  c  d

- 22.  a  b  c  d
- 23.  a  b  c  d
- 24.  a  b  c  d
- 25.  a  b  c  d

# Natural Resources and Their Conservation

- Soil is one of the most important natural resources. It is the home for many organisms and it is essential for agriculture. The rotting dead matter in the soil is called humus. Soil is formed by the process of weathering.
- The phenomenon of absorption of water by soil is termed as percolation. The percolation rate of water is different in different types of soil. It is highest in sandy soil and least in clayey soil.
- Water that is fit for human consumption is called freshwater. Only 0.006 percent of the water on the earth is actually available for our use. Sometimes, groundwater accumulates between layers of hard rock. This is known as an aquifer. Water in aquifers can be drawn with tube wells and hand pumps.
- Water management is the continuous matching of water resources with the water requirements of a place. Water management essentially involves activities that identify sources of water, prevent wastage of water, and implement recycling of water. It may also include treatment of water to make it suitable for human consumption.
- Rainwater harvesting can be used to raise the water table in arid areas. It can also be used to create water storage areas.
- Forest serves as green lungs and water purifying systems in nature. Forests play a vital role in the preservation of the water cycle. By the process of transpiration and photosynthesis, forests maintain the temperature. Forests play a very important role in the food chain.

## SECTION - A : SCIENTIFIC REASONING

1. If it rains heavily for 6 months (continuously), the total amount of water on earth will:
  - a. Increase
  - b. Decrease
  - c. Remain same
  - d. Show variations
2. Which of the following is incorrect for vermin-processing toilets?
  - a. It has been found to be a novel, less water consuming toilets for safe processing of human waste.
  - b. It is a scientific method used to decrease pollution caused by human excreta.
  - c. The human excreta is treated with roundworms and cockroaches.
  - d. The human excreta is completely converted to vermicompost.
3. The presence of which microorganism in the Ganga water indicates contamination?
  - a. Lactobacillus bacteria
  - b. Amoeba
  - c. Coliform bacteria
  - d. Macrospores
4. The given figure is related with:
  - (i) Conservation of natural resources.
  - (ii) Development of new breeds of forest plants.
  - (iii) Zoological Survey of India.
  - (iv) Forest conservation.

a. (i) and (ii)      b. (ii) and (iii)  
  c. (i) and (iv)     d. Only (i)

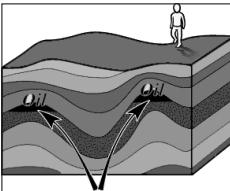

5. Why are food chains usually limited to only four or five trophic levels?
  - a. There is insufficient biomass to support higher trophic levels.
  - b. There are insufficient numbers of organisms to support higher trophic levels.
  - c. There is significant loss of energy at each transfer in a food chain.
  - d. There are very few types of top carnivores
6. What is the side effect of heavy and constant grazing?
  - a. Upper layers of soil are loosened and are eroded.
  - b. Lower layers are made more compact and root respiration is interfered with.
  - c. Lower compact layers make root penetration difficult.
  - d. All of these
7. Deforestation is the major causal agent of:
  - I. Depletion of natural resources.
  - II. Environment pollution.
  - III. Desertification of habitat.
  - IV. Genetic erosion.

a. I and II      b. III and IV  
  c. Both a and b    d. I, III and IV
8. Which of the following causes alkalinity as well as hardness in natural water?
  - a. Calcium carbonate
  - b. Calcium bicarbonate
  - c. Magnesium carbonate
  - d. All of these
9. The bar graph shows percentages of various types of energy used in India in the year 2007-2010. On the basis of the statement given in the box and the graph, here W represents:
 

X axis  
 Y axis

|     |             |     |     |                |     |
|-----|-------------|-----|-----|----------------|-----|
| W   | Natural gas | X   | Y   | Hydro-electric | Z   |
| 40% | 35%         | 28% | 20% | 15%            | 10% |

Shortage of coal in the year 2012

- a. Coal                    b. Petroleum  
 c. Solar energy           d. Wind energy
10. Which of the following is correct about the figure shown here?
- a. It is an anticline trap.  
 b. It is a fold structure with an arch of non-porous rock overlying reservoir rock.  
 c. It provides a trap in which oil, gas or water may be accumulated.  
 d. All of these
- 
11. The microbes present in the soil require moisture and nutrients for growth and survival. Which of the following is the suitable place for microbes to grow?
- a. Desert                    b. Forest  
 c. Open field                d. Cricket ground
12. Water is an inexhaustible, reversible resource, still there is shortage of water at many places in the world. What could be the possible reason for shortage of water?
- a. Rainwater cannot be used.  
 b. Water available in rivers and lakes can also not be used.  
 c. 97.4% of all available water is frozen in the glaciers and the polar ice caps.  
 d. Much water available to us is not in usable form.
13. Read the given statement about some of the natural resources.
- I. Van Mahotsava is a festival of cutting down trees.  
 II. World forest day is celebrated on 21st March every year.  
 III. Quinine is obtained from the bark of Cinchona tree. It is widely used to treat malaria.  
 IV. Some animals help in keeping our environment clean as they consume dead animals and dispose them off.
- Choose the correct statements.
- a. I & II                    b. I, II & III  
 c. II, III & IV              d. All are correct
14. Air above the soil seems to shimmer during hot summers because:
- a. Shiny surface of soil reflects light.  
 b. Shiny surface of soil reflects air.  
 c. Water vapour coming out of the soil refracts the sunlight.  
 d. Water vapour coming out of the soil reflects the air.
15. Which among the following serve(s) as green lungs?
- a. Green pigment of the plants  
 b. Forests  
 c. Kitchen  
 d. Greenhouse gases

## SECTION - B : EVERYDAY SCIENCE

16. A man while digging a pit found that he could dig with ease initially but as he went deeper, digging became difficult. He could not dig beyond 5-6 feet. What could be the possible reason for it?
- a. Top soil or sub soil comprises humus and nutrients, so it becomes easy to dig.  
 b. Lower layers are made of small, particles weathered rocks and bedrocks.
- c. Both a and b  
 d. Beneath the top soil, there is a layer of groundwater, too difficult to dig.
17. Mr. Verma had a pond in his garden filled with all kinds of aquatic plants. He wanted to prevent mosquitoes from breeding in pond without harming the plants in any way. He could \_\_\_\_\_.

- a. Add salt into the water.  
 b. Add some goldfish into the pond.  
 c. Spray a film of oil on the surface of the pond.  
 d. Both a & c
18. A large area of forest was cleared by burning to construct some buildings. Which of the following statements is correct regarding the consequence of this action?  
 a. The land will have more fresh air.  
 b. Wildlife will easily thrive in the cleared area.  
 c. Rate of erosion will increase in that area.  
 d. New trees will grow faster and replace the burnt soil soon as the ash of the burnt trees increases the fertility of the soil.
19. A student is studying about the wide variety of forests around the world. He recorded some characteristics of one forest that he is interested about.  
 I. Located around North America and Middle of Europe.  
 II. Average rainfall is 30 to 60 inches per year.
- III. Inhabited by large trees such as Oak, Elm and Maple.  
 IV. The animals are hibernating so as to adapt to the changing climate.
- What type of forest is he looking at?  
 a. Taiga                      b. Deciduous forest  
 c. Tundra                      d. Rain forest
20. A man while travelling to Rajasthan, observed several streams and rivulets of rainwater during the journey, but to his surprise he did not see streams of water in the desert region even during rains.
- What could be the possible reason/explanation for this?  
 a. Deserts are vast stretches of sand so the rainwater immediately percolates downwards.  
 b. Deserts are vast stretches of sand so the rainwater immediately percolates upwards.  
 c. No percolation is possible between the sand particles.  
 d. In deserts rate of evaporation is very high and so no streams are formed.

### SECTION - C : BRAINBOX

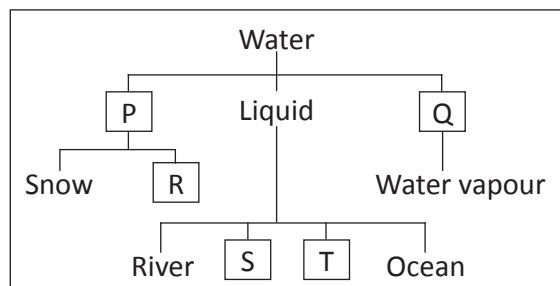
21. Match the Column 'A' with Column 'B'.

| Column A          | Column B                            |
|-------------------|-------------------------------------|
| p. Earthworm      | i. Sand & beaches                   |
| q. Garden lizard  | ii. Burrows in soil                 |
| r. Crab           | iii. Deep narrow holes in dry soils |
| s. Rodents        | iv. Soil surface                    |
| t. Scorpion       | v. Surface of shaded moist soils    |
| u. Snails & slugs | vi. A - horizon of moist soil       |

Choose the correct option.

- a. p- (ii), q- (iv), r- (i), s- (iii), t- (vi), u- (v)  
 b. p- (vi), q- (iv), r- (i), s- (ii), t- (iii), u- (v)  
 c. p- (v), q- (iv), r- (ii), s- (iii), t- (i), u- (vi)  
 d. p- (vi), q- (iv), r- (ii), s- (i), t- (v), u- (iii)

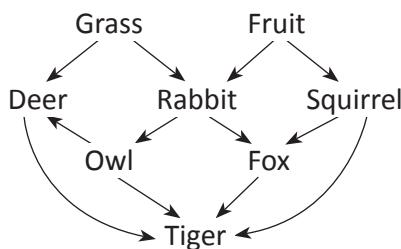
22. Complete the given flow chart using appropriate words.



### What are P, Q, R, S and T?

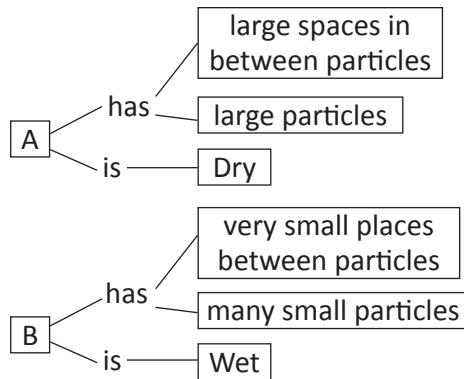
- P- Solid, Q- Gas, R- Ice, S- lake, T- Well
- P- Solid, Q- Gas, R- Dew, S- Well, T- Hand pump
- P- Gas, Q- Solid, R- Stream, S- Rainwater, T- Hand pump
- P- Gas, Q- Solid, R- aquifer, S- Rainwater, T- Lake

23. Study the food web given here



What will happen if a snake is introduced into the given ecosystem?

- The number of rabbits will decrease.
  - The number of tigers will decrease.
  - The quantity of grasses and fruits will decrease.
  - The number of tigers will increase.
24. Raman and Radhika collected 2 samples of soil A & B from different places. They observed the samples and recorded their characteristics in the flow charts.



Why sample A is dry but sample B is wet?

- Sample 'A' has large spaces while sample 'B' has small spaces between the particles.
- Sample 'A' does not hold water while sample 'B' holds water.
- Water flows quickly through sample 'A' while very slowly through sample 'B'.
- All are correct

25. Study the given table. Which of the following is not a correct match?

|    | Column A             | Column B                |
|----|----------------------|-------------------------|
| a. | Inorganic impurities | Nitrates & phosphates   |
| b. | Organic impurities   | Pesticides & herbicides |
| c. | Bacteria             | Polio & Measles         |
| d. | Nutrients            | N <sub>2</sub> & P      |

Darken your choice with HB pencil –

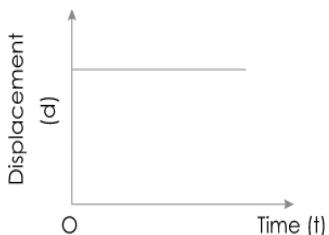
- |                            |                         |                         |                         |                             |                         |                         |                         |                             |                         |                         |                         |                             |                         |                         |                         |
|----------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|-----------------------------|-------------------------|-------------------------|-------------------------|
| 1. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 8. <input type="radio"/> a  | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 15. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 22. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
| 2. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 9. <input type="radio"/> a  | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 16. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 23. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
| 3. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 10. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 17. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 24. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
| 4. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 11. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 18. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 25. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |
| 5. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 12. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 19. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |
| 6. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 13. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 20. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |
| 7. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 14. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d | 21. <input type="radio"/> a | <input type="radio"/> b | <input type="radio"/> c | <input type="radio"/> d |                             |                         |                         |                         |

# Motion and Time

- Motion is a change in the position of an object or a process of moving or being moved. When a body changes its position with respect to its surrounding, the body is said to be in motion.
- Speed is how fast an object is going with respect to an object. Velocity is a measure of the speed in a given direction. You can say the top speed of an aeroplane is 300 kilometers per hour (kph). But its velocity is 300 kph in a northeast direction.
- Objects that move in a straight line and maintain the same speed throughout the distance covered are said to be in uniform motion.
- The time period of a pendulum is the time taken for one full oscillation.
- The graph for a body in uniform motion will be a straight line making angle horizontally. The speed of a body at rest is zero at any point of time. Hence, its graph is a straight line along the X-axis.
- The speed of a moving body at any particular instant of time is called its instantaneous speed.

## SECTION - A : SCIENTIFIC REASONING

- 1 'A satellite is moving in space'. Which of the following is correct about its speed/velocity?
  - a. It has a uniform velocity.
  - b. It has a zero velocity.
  - c. It has a constant speed.
  - d. Both b and c
2. Which of the following motions is correct for the motion of a horse pulling a cart on a straight road?
  - a. Oscillatory motion
  - b. Circular motion
  - c. Rectilinear motion
  - d. Both a and c
3. A simple pendulum completes 30 oscillations in 15 seconds. What is the time-period of the pendulum?
  - a. 1 second
  - b. 2 second
  - c. 0.5 second
  - d. 1.5 second
4. The velocity-time graph of accelerated motion helpful in determining the motion of the object is:
  - a. The velocity of the object at a given instant.
  - b. The total distance travelled by the object in a given time.
  - c. The force on an object by the other object.
  - d. None of these
5. Given displacement-time graph of an object is parallel to time axis. What will be the velocity of the object?



- a. Infinity
  - b. Zero
  - c. Greater than zero
  - d. Less than zero
6. Which of the following options is correct for the quartz crystals?
    - a. It emits vibrations of fixed frequency.
    - b. It measures time upto milliseconds.
    - c. Quartz crystal clock is more accurate than the clocks of earlier time.
    - d. All of these
  7. Objects in motion tend to remain in motion, whereas objects at rest tend to remain at rest. It is called:
    - a. Velocity
    - b. Motion
    - c. Inertia
    - d. None of these
  8. Which of the following displacement-time graph for an object moving with a constant velocity is correct?
 

a.

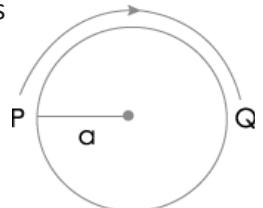
b.

c.

d.
  9. Sapna covers a distance of 5 km by running with a uniform speed of 2.25 km/h. Rakesh runs 0.6 km in 7.5 minutes. Which of the following options is correct for this?
    - a. Sapna's speed is lower than Rakesh's.
    - b. Rakesh's speed is lower than Sapna's.
    - c. Both of them have same speed.
    - d. Speed cannot be determined
  10. The odometer of a car reads 57321.0, km when the clock shows the time 08:30 am. The distance moved by the car, if at 08:50 am, the odometer reading has changed to

- 57336.0 km, is 15 km. Find the speed of the car during the time.
- 15 km/s
  - 2.5 km/s
  - 0.35 km/s
  - 0.75 km/s
11. Rohit walks 8 m towards east and then 6 m towards north. What is the displacement of his journey?
- 2 m
  - 20 m
  - 10 m
  - 8 m
12. A bus runs at a constant speed on a circular track of radius 200 metres, taking 62.8 seconds on each lap. What are the average velocity and the average speed, respectively on each lap?
- $20 \text{ m s}^{-1}$ ,  $10 \text{ m s}^{-1}$
  - $5 \text{ m s}^{-1}$ ,  $20 \text{ m s}^{-1}$
  - $0 \text{ m s}^{-1}$ ,  $10 \text{ m s}^{-1}$
  - $0 \text{ m s}^{-1}$ ,  $20 \text{ m s}^{-1}$
13. Which of the following is not considered to be an acceleration?
- A bus changing its speed from 30 m/s to 50 m/s.

- A car traveling around a bend at 40 km/h.
  - A plane coming down to land at a speed of 180 m/s.
  - A boy traveling at 15 m/s over 100 metres.
14. An artificial satellite is moving in a circular orbit of radius nearly 42,250 km. It takes 24 hours to revolve around the earth. What is the velocity of the satellite?
- $5.06 \text{ km s}^{-1}$
  - $3.07 \text{ km s}^{-1}$
  - $2.53 \text{ km s}^{-1}$
  - $1.53 \text{ km s}^{-1}$
15. The given figure shows that a motorbike moves from point P and goes round a circle of radius  $a$  and reaches point Q, exactly at the other side of the point P. The displacement of the motorbike would be:

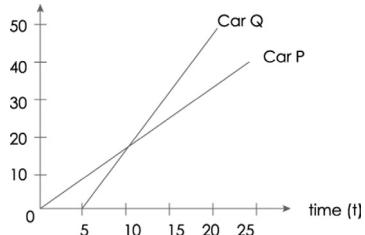


- $2\pi a$
- $\pi a$
- $2a$
- $4a$

## SECTION - B : EVERYDAY SCIENCE

16. Rakesh goes to the market slowly and purchases a mobile and then he comes back steadily. Which of the following displacement time graph is correct for Rakesh's journey?
- a.
- b.
- c.
- d.

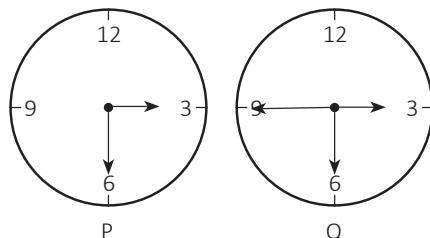
17. A boy walks on a straight road from his home to park 2.5 km away with a speed of 5 km/h. Finding the park closed, he instantly turns and walks back with a speed of 7.5 km/h. Find the average velocity of the boy over the time interval of 0 to 30 minutes.
- 10 km/h
  - 5 km/h
  - 2.5 km/h
  - 20 km/h
18. From the given distance-time graph, which of the following is correct?



- a. Car P travels at a greater speed.  
 b. Car Q travels at a greater speed.  
 c. Both travel at equal speed.  
 d. None of these
19. "Aditi and Garima started running from one end of a street to the other end and then headed back. While coming back, Aditi was ahead of Garima."
- Vidya made some statement about the distances covered and displacement from the origin point before reaching the origin. Which of the following statements is correctly stated by Vidya?
- a. The distance and displacement of Aditi is greater than that of Garima.  
 b. The distance and displacement of Garima is greater than that of Aditi.  
 c. Aditi ran greater distance lesser displacement than Garima.

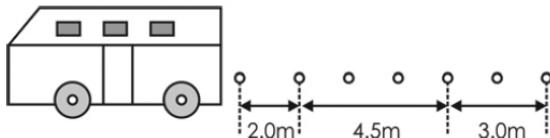
- d. Garima ran greater distance but showed lesser displacement than Aditi.

20. Observe the given figures. These are two watches.



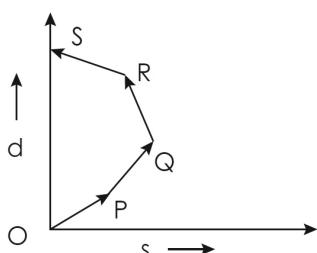
A student stated some statements about these clocks. Choose the correct statement.

21. In the given figure, a bus has a hole in the petrol tank and petrol is dripping off the tank at a constant interval of four drops per 5 seconds.



What is the average speed of the bus from the given figure?

- a. 1.09 cm/sec      b. 2.3 cm/sec  
 c. 0.95 cm/sec      d. 5 cm/sec
- 22.



- a. Time interval of 1 h 15 min can only be measured by the watch Q.  
 b. Time interval of 3 min 3 s can only be measured by the watch P.  
 c. Time 3 : 15 : 20 can be shown by both the watches.  
 d. All are correct

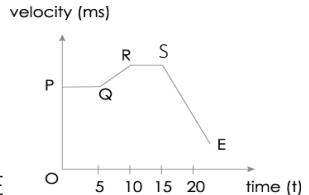
### SECTION - C : BRAINBOX

For an object having a straight line motion represented by the graph shown in the figure, which of the following options is correct for this motion?

- a. The object moves with constantly increasing velocity from O to P and then it moves with constant velocity.  
 b. Velocity of the object increases uniformly.  
 c. Average velocity is zero.  
 d. Both a and c

23. The given velocity time graph shows a car moving on the road. During what stage of the journey, is it decelerating at a steady rate?

- a. Q to R  
 b. S to E  
 c. R to S  
 d. P to Q and S to E



24. Read the statements carefully and mark the correct option.
- An object can have a constant speed and still have a varying velocity.
  - An object can have constant velocity and still have a varying speed.
  - The direction of an object does not change when the magnitude of its acceleration is constant.
- IV. Speed =  $\frac{\text{displacement}}{\text{Time}}$
- Only I
  - Only II
  - I and II only
  - All of these
25. Two identical metal coins are dropped separately into two identical tubes. One of the tubes is filled with air and the other has its air pumped out with a vacuum pump. Which of the following observations is/are true?
- Both the metal coins will drop at a same speed.
  - Both the metal coins will accelerate at a different rate.
  - Both the metal coins will reach the bottom of the tube at the same time.
- II only
  - I and II only
  - II and III only
  - None of these

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Darken your choice with HB pencil -

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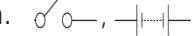
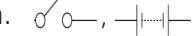
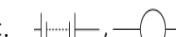
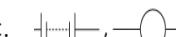
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| 1. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 8. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d  | 15. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 22. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |
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| 7. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 14. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 21. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d |                                                                                                     |

## Electric Current:

The flow of electric charge is called electric current. In an electric circuit, the charge is often carried by moving electrons.

- A simplified conventional pictorial representation of an electrical circuit, using standard symbols for electric components, is called a circuit diagram.
- A closed path formed by the interconnection of electrical components through which electric current flows is called an electrical circuit.
- If current does not flow through a circuit, then it is said to be an 'open' circuit or incomplete. Its switch is in 'off' position.
- A circuit is said to be a closed circuit or complete, when current flows through it. Its switch is in 'on' position.
- An electric cell is a device which produces electric charge because of some chemical reactions. The cell which is used in a torch is called a dry cell. The wet cells are used in car batteries.
- A group of cells is called a battery. More than one cell is used in most of the devices.
- We use many appliances every day, that work on the property of the heating effect of electric current. For example, the electric room heater, electric chapati maker, electric iron, toaster, hair dryer, electric stove, immersion water heater, food warmer, electric coffee maker, electric rice cooker and geyser.
- When electric current flows through a wire wound around an iron bar, the bar behaves like a magnet. This magnet is called an electromagnet.

## SECTION - A : SCIENTIFIC REASONING

1. Among the given options, which is the best conductor of electricity?
  - (i) Silver (ii) Iron (iii) Copper
  - a. (i) only b. (ii) only
  - c. (iii) only d. Both (ii) and (iii)
2. Which of the following options is true for the given statements?
  - (i) Aluminium and silver can be used to conduct electricity.
  - (ii) Only aluminium can be used to conduct electricity.
  - a. Only (i) is true.
  - b. Only (ii) is true.
  - c. Both (i) and (ii) are true.
  - d. Both (i) and (ii) are incorrect.
3. If you put a second battery in a simple circuit, how will it affect the brightness the bulb?
  - a. The bulb will be brighter.
  - b. The bulb will be fused.
  - c. Brightness of the bulb will reduce.
  - d. Can't say
4. Only iron is used for making electromagnets; not nickel, steel, cobalt. It is because of:
  - a. Iron is cheap and easily available.
  - b. Iron is a good conductor of electricity.
  - c. When current is switched off in the coil of an electromagnet made of iron, iron loses all its magnetism.
  - d. None of these
5. Among the given symbols, which are the correct representations of lamp and ammeter, respectively?
  - a.  , 
  - b.  , 
  - c.  , 
  - d.  , 
6. The flow of current between two charged connected bodies is not possible. It is because
  - a. They have the same quantity of charge.
  - b. They have the same potential.
  - c. They have the same capacity.
  - d. Both a and c
7. Which one of the given statements is correct?
  - a. Circuit breakers cannot protect against large amount of electricity.
  - b. Fuses can be used once they blow by replacing their wires.
  - c. Fuses are very expensive to buy.
  - d. Circuit breakers cannot be reset after electrical overload.
8. There are four basic electrical quantities given. Which of the following is related to each other?
  - I. Electric current II. Resistance
  - III. Potential difference
  - IV. All of these
  - a. I and II
  - b. II, III
  - c. I, III
  - d. I, II, III
9. The current always comes from:
  - a. Positive terminal of the battery, passing through the external circuit and enters in the negative terminal of the battery.
  - b. Negative terminal of the battery passing through the external circuit and enters in the positive terminal.
  - c. Both a and b are possible.
  - d. None of these
10. Why is electrical energy usually transmitted at high voltage in transmission cables?
  - a. To make the resistance of the transmission cables as small as possible.
  - b. To make the transmission cables safe to handle.

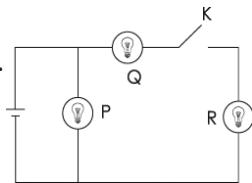
- c. To minimise the loss of energy in the transmission cables.  
d. To make the current in the transmission cables as large as possible.
11. When the amount of current passing through a wire increases, the heat produced in the wire will:  
a. Increase  
b. Decrease  
c. Remain unchanged  
d. None of these
12. Which one of the following is true about one ampere?  
a. One ampere represents the flow of one coulomb of electrical charge per second.  
b. One ampere represents the flow of ten coulomb of electrical charge per second.  
c. One ampere represents the flow of one coulomb of electrical charge per minute.  
d. One ampere represents the flow of ten coulomb of electrical charge per hour.
13. Which of the following is a factor affecting the power efficiency of a solar panel?  
(i) The direction where the solar panel is facing.  
(ii) The hours of rainy day per year.
- (iii) The level of air pollution in the area.  
a. (i) and (ii) only      b. (i) and (iii) only  
c. (ii) and (iii) only      d. (i), (ii) and (iii)
14. Read statements 1 and 2 and choose the correct option for this.  
Statement 1: Pure water is a good conductor of electricity.  
Statement 2: Pure water is a bad conductor of heat.  
a. Statement 1 is false and statement 2 is true.  
b. Both, statement 1 and statement 2 are true.  
c. Both, statement 1 and statement 2 are false.  
d. Statement 2 is false and statement 1 is true.
15. Neutral insulator A is rubbed with neutral insulator B. Insulator A becomes positively charged after rubbing. It is because:  
a. Insulator A loses some electrons to insulator B.  
b. Insulator B loses some electrons to insulator A.  
c. Insulator A gains protons from insulator B.  
d. Insulator B gains protons from insulator A.

## SECTION - B : EVERYDAY SCIENCE

16. In Indian houses, all electrical devices operate on 220 V. It means:  
a. Electrical devices are connected in parallel.  
b. Electrical devices have currents of equal values.  
c. Electrical devices are connected in series.  
d. Electrical devices have same resistance.
17. A hair dryer contains a heater. The heater has two coils connected in parallel. Which of the following statements is correct?
- a. A current of 2A flows through each of the coils.  
b. There is same voltage across both the coils.  
c. The total resistance of the coils is the sum of their separate resistances.  
d. The total voltage of the supply is shared between the coils.
18. A rod, made of an insulating material carries a positive charge after it is rubbed with a woollen cloth. Which one of the following explanations is correct for this?

- a. Friction causes positive charges on the rod to become negative.
- b. Positive charges are transferred from the rod to the cloth.
- c. Electrons are transferred from the rod to the cloth.
- d. Electrons are transferred from the cloth to the rod.
19. Amit connects the switch along the neutral wire of a fan. Which of the following statements is/are correct?
- (i) The fan will still operate when the switch is opened.
- (ii) The fan will not operate when the switch is closed.
- (iii) The fan will still be connected to the high voltage source when the switch is open.
- a. (i) only
- b. (iii) only
- c. (i) and (iii)
- d. (ii) and (iii)
20. Read the following statements and mark the correct option.
- (i) The wire used in a fuse has high melting point.
- (ii) The wire used in a fuse has low melting point.
- (iii) The wire used in a fuse has an average melting point.
- a. (i) only
- b. (ii) only
- c. (i) and some times (iii)
- d. None of these

### SECTION - C : BRAINBOX

21. Mohit wants to charge a metal ball by induction, using a strip of polythene. He uses the given four steps but not in the following order.
- (i) The metal ball is earthed momentarily.
- (ii) The polythene strip is brought up to the ball.
- (iii) The polythene strip is removed.
- (iv) The polythene strip is rubbed with a woollen cloth.
- In which order should he carry out the steps to charge the ball correctly?
- a. ii, iii, iv, i
- b. ii, iv, iii, i
- c. iv, i, ii, iii
- d. iv, ii, i, iii
22. In the given circuit, the bulbs are identical. If switch K is closed, then:
- 
- a. The brightness of P decreases.
- b. The brightness of P is same as R.
- c. P is dimmer than Q.
- d. The brightness of P remains the same.
23. There are 3 bulbs with same resistance;  $B_1$  and  $B_2$  connected in parallel, which in turn are connected in series with  $B_3$ . This circuit is connected to a switch and a cell. The circuit is closed. If  $B_3$  fuses, what will happen to the brightness of  $B_1 + B_2$ ?
- | $B_1$       | $B_2$    |
|-------------|----------|
| a. Dimmer   | Dimmer   |
| b. Brighter | Brighter |
| c. Dimmer   | Brighter |
| d. Brighter | Dimmer   |

24. A positively charged pith ball attracts another suspended pith ball. Which of the following statements about the second pith ball is correct?
- It must have fewer positive charges.
  - It must be negatively charged.
  - It does not need to be charged.
  - It must be earthed.
25. Two electrical heaters have different resistances of their heating elements. Which one will produce more heat, when the same voltage is applied across the elements?
- The one with smaller resistance.
  - The one with greater resistance.
  - They will produce same amount of heat.
  - None of these

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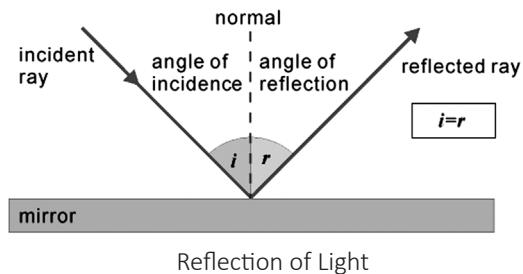
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| 7. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 14. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d | 21. <input type="radio"/> a <input type="radio"/> b <input type="radio"/> c <input type="radio"/> d            |                                                                                                     |

⇒ Light is a form of energy which helps us to see objects.

- Reflection of light is the phenomenon of bouncing back of light after striking a smooth polished surface.

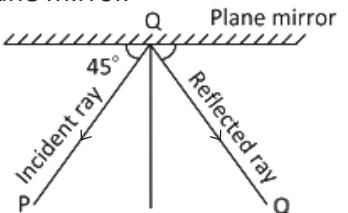


- Humans see light in seven different colours: Red, Orange, Yellow, Green, Blue, Indigo and Violet (ROY G BIV).

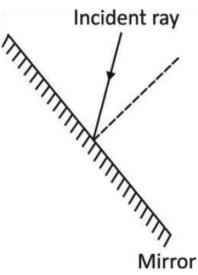
⇒ All objects reflect or absorb the seven different colours of light. Objects appear to be of different colours based on what colours they reflect.

- Opaque objects block all the light.
- Some objects don't block any light – like glass windows. These are called transparent objects.
- Objects that block part of the light, but let part of the light to pass through them are called translucent objects.
- Lateral inversion is the phenomenon due to which the left side of an object appears to be on the right side of the object in its image in a reflecting medium, (mirror) and vice-versa.

## SECTION - A : SCIENTIFIC REASONING

1. What is the type of material through which light can pass but will be scattered in different directions?
  - a. Translucent
  - b. Refraction
  - c. Reflection
  - d. Transparent
2. When a parallel beam of light strikes on the surface of a concave mirror, what happens to the beam of light after reflection?
  - a. Diverges
  - b. Converges
  - c. Goes straight
  - d. Some gets diverged and some goes straight.
3. Which of the following are the properties of plane mirror image ?
  - I. The image is at the same distance as the object.
  - II. The image is upright.
  - III. The image is laterally inverted.
    - a. Only I
    - b. I and II
    - c. II and III
    - d. I, II and III
4. What are the three possible results that occur when light strikes matter?
  - a. Light can be reflected, absorbed or transmitted.
  - b. Light can be enhanced, absorbed or transmitted.
  - c. Light can be given energy, diffused or absorbed.
  - d. Light can be enhanced, diffused or absorbed.
5. When a girl sees herself in a mirror, what do her eyes observe?
  - a. A virtual image the rays of which originate at the girl.
  - b. A virtual image formed from light rays that originate behind the mirror.
  - c. A real image the rays of which appear to originate at the person.
  - d. A real image the rays of which originate behind the mirror.
6. In the given figure, a ray of light PQ strikes at an angle  $45^\circ$  on a plane mirror as shown in the figure. Find the reflected angle made by the plane mirror.
  - a.  $65^\circ$
  - b.  $35^\circ$
  - c.  $45^\circ$
  - d.  $15^\circ$
7. Priya inserts a pencil into water at some angle. She notices that the pencil appears to be broken. Why did this happen?
  - a. Because of the dispersion of light.
  - b. Because of the reflection of light.
  - c. Because of the refraction of light.
  - d. Both a and b
8. Rainbow is produced in the sky due to the sunlight. Which of the following is involved in the formation of rainbow in the sky?
  - a. Dispersion and total internal reflection of the sunlight.
  - b. Diffusion of the sunlight.
  - c. Due to only refraction of the sunlight.
  - d. All of these

9. In the given diagram, a ray of light falls on a mirror. When the angle between the incident and the reflected ray is  $60^\circ$ , then what is the angle of the incident ray?



- a.  $30^\circ$       b.  $40^\circ$   
c.  $50^\circ$       d.  $60^\circ$

10. Index of refraction can change for a gas such as air. What causes the change and what is the consequence of such a change?

- a. An increase in temperature reduces the refractive index slightly, which causes decrease in the angle of refraction at higher temperature.  
b. An increase in temperature reduces the air's index of refraction, which causes horizontal light rays to bend from a layer of hotter air to a layer of cooler air.  
c. A decrease in temperature increases the index of refraction and there is a change in the propagation of light from hot air to cool air.  
d. The index of refraction of air will change if the wind is blowing and light rays are thereby deflected.

11. A boy of height 0.8 m stands at a distance 0.4 m in front of a vertical plane mirror. The bottom edge of the mirror is 0.4 m from the ground. What is the minimum length of the mirror which will allow the boy to see the whole of himself?

- a. 0.25 m      b. 0.4 m  
c. 1 m      d. 0.8 m

12. Which of the following is defined as the refractive index of a medium?

- a. The ratio of the speed of light in vacuum to the speed of light in air.

- b. The ratio of the speed of light in air to the speed of light in vacuum.  
c. The ratio of the speed of light in vacuum to the speed of light in medium.  
d. The ratio of the speed of light in medium to the speed of light in vacuum.

13. In a search light, which of the following mirror is used?

- a. Convex mirror  
b. Concave mirror  
c. Plane mirror  
d. Both a and b

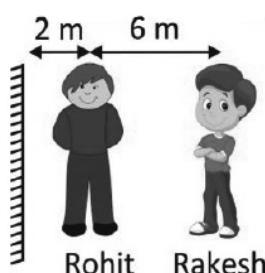
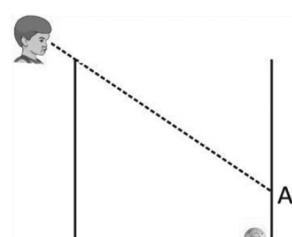
14. Which one of the following is not a property of the image of an object placed 12 cm in front of a plane mirror?

- a. A line joining the top of the object to the top of the image is perpendicular to the plane of the mirror.  
b. It is behind the mirror and laterally inverted.  
c. It is 12 cm from the mirror.  
d. It is real.

15. Read the given statements carefully and mark the correct option.

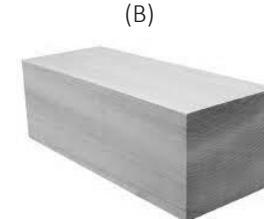
- I. When the object is placed nearer to the focal point of the converging lens, the image gets bigger.  
II. When the object is placed further away from the converging lens, the image gets smaller.  
III. When the object is placed very far away from the converging lens, the image distance approaches focal length.  
a. Only I  
b. I and III  
c. II and III  
d. I, II and III

## SECTION - B : EVERYDAY SCIENCE

16. A girl wants to see the image of her face. She looks into a mirror by placing her face close to the mirror and finds her image to be erect and magnified. What type of mirror did she use?
- Concave mirror
  - Convex mirror
  - Both a and b
  - Plane mirror
17. Rohit and Rakesh are standing in front of a mirror as shown in the figure. If Rohit walks 4 m backward and then looks into the mirror, how far away from him would Rakesh appear to be?
- 
- Rohit      Rakesh
- 7 m
  - 12 m
  - 14 m
  - 16 m
18. A boy looks into a tall container and sees a coin which is placed at the bottom. When his line of sight includes point A above the coin, he cannot see the coin. When water is slowly poured into the container, the person suddenly sees the coin when the water reaches a certain level. Which of the following reasons is correct?
- 
- Light from the eye is refracted when it passes from the air to the water.
  - Light from the coin is refracted when it passes from the water into the air.
  - Light is reflected from the surface of the water.
  - None of these
19. Spherical mirrors are widely used as a rear view mirror in the automobiles. Why the word AMBULANCE is differently painted in front of the hospital vans?
- It is accurately readable by the rear view mirror.
  - It reads erratic by the rear view mirror.
  - Both a and b
  - None of these
20. Myra had two different objects in her hands.
- 

(A)

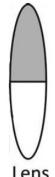
A glass



(B)

A wooden block
- She was trying to see through these objects, 'A' & 'B'. She couldn't see through the object 'B'. What could be the possible reason?
- 'A' is transparent and 'B' is opaque.
  - Light rays couldn't pass through the object 'B'.
  - Both reflection and refraction of light rays occur through object 'A'.
  - All are correct

## SECTION - C : BRAINBOX

21. Which of the following statements is/are correct for given mirrors?
- I. A concave mirror can give a virtual image.
  - II. A convex mirror can give a virtual image.
  - III. A concave mirror can give a diminished virtual image.
  - IV. A convex mirror cannot give a real image.
- Only I
  - Only I and III
  - Only II
  - All of these
22. Amit arranges an illuminated object, a lens and a screen such that the size of the image is twice that of the object. Keeping the distance between the screen and the illuminated object fixed, he exchanges the position of the screen and the illuminated object. Amit's observation on this screen is:
- A sharp image half the size of the object.
  - A sharp image twice the size of the object.
  - A blurred, magnified image.
  - A blurred, diminished image
23. Converging lenses P and Q have the same focal length, but Q has only half the diameter of P. Both lenses are used to form images of distant objects on a screen. Which of the following statements is correct?
- For both the lenses, the images are of the same brightness.
  - For both the lenses, the images are of the same size as the object.
  - For both the lenses, distance from the lens to the screen is same.
  - Lens Q gives a smaller image than P.
24. The top half of the lens is covered with an opaque material as shown in figure. What will happen to the image of an object on the screen?
- 
- Image size will be reduced to half its original size.
  - No image will be formed on the screen.
  - One fourth image will be formed on the screen.
  - The brightness of the image will be reduced.
25. In the given properties which one of the following is not correct about the image that is formed when an object is placed beyond the centre of curvature of a concave mirror?
- Image is inverted.
  - Image is larger than the object.
  - Image is formed in front of the mirror.
  - Image is real.

Darken your choice with HB pencil –

1.  a  b  c  d  
 2.  a  b  c  d  
 3.  a  b  c  d  
 4.  a  b  c  d  
 5.  a  b  c  d  
 6.  a  b  c  d  
 7.  a  b  c  d

8.  a  b  c  d  
 9.  a  b  c  d  
 10.  a  b  c  d  
 11.  a  b  c  d  
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 19.  a  b  c  d  
 20.  a  b  c  d  
 21.  a  b  c  d

22.  a  b  c  d  
 23.  a  b  c  d  
 24.  a  b  c  d  
 25.  a  b  c  d

# Chapter 15

# Logical Reasoning

**Direction – In Q. No. 1 and Q. No. 2: Letters take the place of numbers. Simplify the equation and find out the value.**

1. If  $V = 4$ ,  $W = 3$ ,  $X = 7$ ,  $Y = 6$  and  $Z = 5$  then  $Y \times Y \div V - W = ?$ 
    - a. X
    - b. V
    - c. Y
    - d. W
  2. If  $P = 9$ ,  $Q = 81$ ,  $R = 27$ ,  $S = 3$  and  $T = 8$  then  $\frac{R \times S}{P} = ?$ 
    - a.  $R \div S$
    - b.  $P \times T$
    - c. R
    - d.  $Q - R$
  3. Which of the letters in the word IMPERSONAL remain at the same position when the letters of the word are rearranged alphabetically?
 

|      |      |
|------|------|
| a. E | b. O |
| c. L | d. M |
  4. If alphabet is written in the reverse order, which will be the 8th letter to the right of letter 'O'?
 

|      |      |
|------|------|
| a. F | b. G |
| c. V | d. W |
- Direction – In Q. No. 5 and Q. No. 6: Find the odd one out.**
5. a. SUV
  - b. TWX
  - c. NQR
  - d. HKL
  6. a. 2F4
  - b. 3H4
  - c. 2J8
  - d. 7P9
  7. What comes next in the given series?  

|                                |                                |                                |                                 |                                 |                                |
|--------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|--------------------------------|
| <input type="text" value="0"/> | <input type="text" value="3"/> | <input type="text" value="9"/> | <input type="text" value="21"/> | <input type="text" value="45"/> | <input type="text" value="?"/> |
|--------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|--------------------------------|
8. Replace the question mark with a suitable number.
 

|                                  |                                 |                                 |                                 |                                |                                |
|----------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|
| <input type="text" value="126"/> | <input type="text" value="62"/> | <input type="text" value="30"/> | <input type="text" value="14"/> | <input type="text" value="6"/> | <input type="text" value="?"/> |
|----------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|

    - a. 1
    - b. 2
    - c. 3
    - d. 4
  9. If ' $\div$ ' denotes ' $\times$ ', ' $+$ ' denotes ' $\div$ ' and '#' denotes ' $+$ ' then simplify  $2 \div 5 + 5 \# 100$ .
    - a. 100
    - b. 102
    - c. 108
    - d. 105
- Direction for Q. No. 10 and Q. No. 11: Identify the rule and find the missing number in place of the question mark.**
10.
 

|     |     |    |
|-----|-----|----|
| 256 | 128 | 32 |
| 112 | 56  | 14 |
| 800 | 400 | ?  |

    - a. 25
    - b. 50
    - c. 100
    - d. 200
  11.
 

|      |      |      |      |      |      |      |      |       |
|------|------|------|------|------|------|------|------|-------|
| $49$ | $24$ | $64$ | $81$ | $21$ | $25$ | $64$ | $?$  | $144$ |
| $25$ | $36$ | $16$ | $9$  | $25$ | $34$ | $25$ | $25$ | $144$ |

    - a. 24
    - b. 23
    - c. 25
    - d. 31
  12.
 

|      |      |      |      |      |      |
|------|------|------|------|------|------|
| $13$ | $15$ | $36$ | $54$ | $45$ | $63$ |
| $23$ | $90$ | $?$  | $?$  | $?$  | $?$  |

    - a. 24
    - b. 28
    - c. 90
    - d. 108

13. In a certain code, BRAIN is written as \* % \$ # x and TIGER is written as \$ # + %. How is RENT written in that code?

- a. % x # \$
- b. % # x \$ %
- c. % + x \$
- d. + x % \$

14. If ENGLAND is written as 1234526 and FRANCE is written as 785291, then how would GREECE be coded?

- a. 381171
- b. 381191
- c. 832257
- d. 381181

15. A boy is facing North – West. He turns  $90^\circ$  in clockwise direction and then  $135^\circ$  in the anticlockwise direction. Which direction is he facing now?

- a. East
- b. North-East
- c. West
- d. North-West

16. A person starts toward South direction. Which of the following order of directions will lead him to East direction?

- a. Right, Right, Right
- b. Left, Left, Left
- c. Right, Left, Right
- d. Left, Right, Left

17. Study the given figures, which shape is different from the others?

- |    |  |    |  |
|----|--|----|--|
| a. |  | b. |  |
| c. |  | d. |  |

**Direction for Q. No. 18 to Q. No. 20: Find the correct figure to replace '?'.**

18. : :: : ?

- a.
- b.
- c.
- d.

19. : :: : ?

- a.
- b.
- c.
- d.

20. Mark with suitable figure.

: :: : ?

- a.
- b.
- c.
- d.

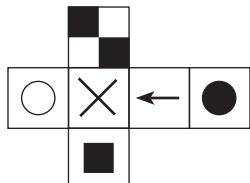
21. Find the mirror image of

- a.
- b.
- c.
- d.

22. Find the water image of WATER?.

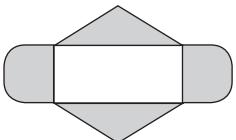
- a.
- b.
- c.
- d.

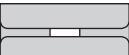
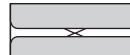
23. Which cube can be made from the given cube net?



- a.
- b.
- c.
- d.

24. How does the given shape look like when folded in?



- a. 
- b. 
- c. 
- d. 

25. Pointing to a photograph, Manish said, "She is the daughter of my grandfather's only son." How is Manish related to the girl/lady in the photograph?

- a. Mother
- b. Sister
- c. Cousin
- d. Grandmother

**Direction for Q. No. 26 to 27: Fill in the blanks using appropriate words.**

26. We are \_\_\_\_\_ to have him \_\_\_\_\_ here to make this function a great success.

- a. Happy, arrive
- b. Pleased, over
- c. Sure, come
- d. Wonderful, again

27. Due to long queues and bad weather, the voters \_\_\_\_\_ their way to polling stations \_\_\_\_\_ a lot.

- a. going, dropped
- b. undaunted, made
- c. encouraged, prepared
- d. making, suffered

**Direction for Q. No. 28 and 29: Pick up the word synonymous with the underlined one in the sentences given here.**

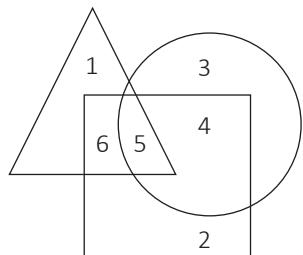
28. The boy gave a graphic account of the theft.

- a. Vague
- b. Vivid
- c. Picture
- d. Drawing

29. The police officer found that the documents recovered were fabricated.

- a. Constricted
- b. Genuine
- c. Forged
- d. Prepared

30. Study the given Venn diagram. Square represents doctors, triangle represents ladies and circle represents professors.



Which number represents the ladies who are both doctors and professors?

- a. 1
- b. 4
- c. 5
- d. 6

31. Jaya walked 10 m toward East and then 10 m to her right. Then everytime turning to her left, she walks 5 m, 16 m and 23 m, respectively. How far is she now from her starting point?

- a. 5 m
- b. 10 m
- c. 20 m
- d. 23 m

32. A 150 m long train is running at a speed of 68 kmph. How long does it take to cross a man who is running at 8 kmph in the same direction in which the train is running?

- a. 5 sec.
- b. 7 sec
- c. 15 sec
- d. 9 sec

33. 9 men, working for 6 hours a day can do a work in 88 days. How many days would 6 men take to complete the same task if they are working for 8 hours a day?

- a. 90 days
- b. 99 days
- c. 109 days
- d. 89 days

34. Which number should be added to 6, 16 and 8 to get an average of 15?

- a. 22
- b. 20
- c. 18
- d. 16

35. A student is ranked 13th from right and 8th from left. How many students are there in total?  
a. 18                          b. 19  
c. 20                          d. 21
36. A vehicle is travelling with  $\frac{3}{4}$  of its actual speed and covers 40 km in 2400 seconds. What is the actual speed of the vehicle?  
a. 80 km/h                    b. 800 km/h  
c. 8 km/h                    d. 18 km/h
37. A father is now three times as old as his daughter. Five years back, he was four times as old as his daughter. What is the age of his daughter?  
a. 12 years                    b. 15 years  
c. 18 years                    d. 20 years
38. If 1st October is Sunday, then 1st November of the same year will be \_\_\_\_\_.  
a. Monday                     b. Sunday  
c. Thursday                    d. Friday
39. A certain number of horses and an equal number of men are going somewhere. Half of the owners are on their horses' back while the remaining ones are walking along leading their horses. If the number of legs walking on the ground is 70, how many horses are there?  
a. 8                            b. 10  
c. 12                            d. 14
40. P, Q, R, S, T, U, V and W are sitting round the circle and are facing the centre.  
I. P is 2nd to the right of T who is the neighbour of R and V.  
II. S is not the neighbour of P.  
III. V is the neighbour of U.  
IV. Q is not between S and W. W is not between U & S.  
What is the position of S?  
a. Between U and V.  
b. Second to the right of P.  
c. To the immediate right of W.  
d. To the immediate left of W.

Darken your choice with HB pencil

- 
1.  a  b  c  d      11.  a  b  c  d      21.  a  b  c  d      31.  a  b  c  d  
2.  a  b  c  d      12.  a  b  c  d      22.  a  b  c  d      32.  a  b  c  d  
3.  a  b  c  d      13.  a  b  c  d      23.  a  b  c  d      33.  a  b  c  d  
4.  a  b  c  d      14.  a  b  c  d      24.  a  b  c  d      34.  a  b  c  d  
5.  a  b  c  d      15.  a  b  c  d      25.  a  b  c  d      35.  a  b  c  d  
6.  a  b  c  d      16.  a  b  c  d      26.  a  b  c  d      36.  a  b  c  d  
7.  a  b  c  d      17.  a  b  c  d      27.  a  b  c  d      37.  a  b  c  d  
8.  a  b  c  d      18.  a  b  c  d      28.  a  b  c  d      38.  a  b  c  d  
9.  a  b  c  d      19.  a  b  c  d      29.  a  b  c  d      39.  a  b  c  d  
10.  a  b  c  d      20.  a  b  c  d      30.  a  b  c  d      40.  a  b  c  d

# Answers

## Chapter 1: Nutrition in Plants and Animals

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | d | 2.  | b | 3.  | a | 4.  | b | 5.  | d | 6.  | a | 7.  | b | 8.  | c | 9.  | b | 10. | a |
| 11. | b | 12. | a | 13. | b | 14. | b | 15. | c | 16. | d | 17. | c | 18. | c | 19. | b | 20. | a |
| 21. | c | 22. | a | 23. | d | 24. | a | 25. | c |     |   |     |   |     |   |     |   |     |   |

## Chapter 2: Respiration in Organisms

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | d | 2.  | b | 3.  | b | 4.  | b | 5.  | b | 6.  | c | 7.  | d | 8.  | a | 9.  | b | 10. | b |
| 11. | a | 12. | a | 13. | c | 14. | c | 15. | c | 16. | b | 17. | d | 18. | b | 19. | a | 20. | a |
| 21. | b | 22. | a | 23. | b | 24. | a | 25. | a |     |   |     |   |     |   |     |   |     |   |

## Chapter 3: Transportation in Plants and Animals

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | b | 2.  | b | 3.  | c | 4.  | a | 5.  | c | 6.  | c | 7.  | a | 8.  | c | 9.  | c | 10. | a |
| 11. | b | 12. | b | 13. | b | 14. | d | 15. | a | 16. | d | 17. | c | 18. | c | 19. | d | 20. | a |
| 21. | c | 22. | b | 23. | a | 24. | a | 25. | d |     |   |     |   |     |   |     |   |     |   |

## Chapter 4: Reproduction in Plants

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | a | 2.  | b | 3.  | d | 4.  | c | 5.  | b | 6.  | d | 7.  | b | 8.  | c | 9.  | a | 10. | d |
| 11. | c | 12. | a | 13. | c | 14. | d | 15. | c | 16. | d | 17. | b | 18. | b | 19. | c | 20. | d |
| 21. | b | 22. | b | 23. | b | 24. | b | 25. | b |     |   |     |   |     |   |     |   |     |   |

## Chapter 5: Heat

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | c | 2.  | c | 3.  | d | 4.  | a | 5.  | a | 6.  | b | 7.  | a | 8.  | b | 9.  | a | 10. | a |
| 11. | c | 12. | a | 13. | d | 14. | c | 15. | d | 16. | b | 17. | d | 18. | c | 19. | a | 20. | b |
| 21. | b | 22. | d | 23. | a | 24. | c | 25. | b |     |   |     |   |     |   |     |   |     |   |

## Chapter 6: Acids, Bases and Salts

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | d | 2.  | a | 3.  | b | 4.  | a | 5.  | b | 6.  | b | 7.  | a | 8.  | a | 9.  | a | 10. | c |
| 11. | a | 12. | c | 13. | d | 14. | a | 15. | b | 16. | c | 17. | c | 18. | c | 19. | b | 20. | c |
| 21. | b | 22. | b | 23. | d | 24. | b | 25. | d |     |   |     |   |     |   |     |   |     |   |

## Chapter 7: Changes Around Us

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | d | 2.  | b | 3.  | c | 4.  | d | 5.  | a | 6.  | d | 7.  | d | 8.  | d | 9.  | d | 10. | a |
| 11. | c | 12. | b | 13. | c | 14. | d | 15. | a | 16. | a | 17. | d | 18. | c | 19. | d | 20. | d |
| 21. | d | 22. | c | 23. | b | 24. | d | 25. | c |     |   |     |   |     |   |     |   |     |   |

## Chapter 8: Weather, Climate and Adaptations of the Animals to the Climate

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | d | 2.  | b | 3.  | d | 4.  | d | 5.  | b | 6.  | a | 7.  | d | 8.  | a | 9.  | c | 10. | c |
| 11. | b | 12. | b | 13. | c | 14. | a | 15. | a | 16. | c | 17. | c | 18. | a | 19. | d | 20. | b |
| 21. | a | 22. | c | 23. | d | 24. | d | 25. | b |     |   |     |   |     |   |     |   |     |   |

## Chapter 9: Winds, Storms and Cyclones

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | c | 2.  | a | 3.  | c | 4.  | b | 5.  | c | 6.  | b | 7.  | c | 8.  | a | 9.  | b | 10. | a |
| 11. | c | 12. | d | 13. | d | 14  | d | 15. | c | 16. | d | 17. | b | 18. | c | 19. | c | 20. | a |
| 21. | c | 22. | b | 23. | d | 24. | a | 25. | b |     |   |     |   |     |   |     |   |     |   |

## Chapter 10: Fibre to Fabric

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | d | 2.  | a | 3.  | b | 4.  | d | 5.  | c | 6.  | c | 7.  | c | 8.  | d | 9.  | a | 10. | d |
| 11. | c | 12. | b | 13. | a | 14  | a | 15. | c | 16. | a | 17. | a | 18. | b | 19. | d | 20. | c |
| 21. | d | 22. | c | 23. | a | 24. | a | 25. | b |     |   |     |   |     |   |     |   |     |   |

## Chapter 11: Natural Resources and Their Conservation

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | c | 2.  | c | 3.  | c | 4.  | c | 5.  | c | 6.  | d | 7.  | c | 8.  | d | 9.  | a | 10. | d |
| 11. | b | 12. | d | 13. | c | 14  | c | 15. | b | 16. | c | 17. | b | 18. | c | 19. | d | 20. | a |
| 21. | b | 22. | a | 23. | a | 24. | d | 25. | c |     |   |     |   |     |   |     |   |     |   |

## Chapter 12: Motion and Time

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | c | 2.  | c | 3.  | c | 4.  | a | 5.  | b | 6.  | c | 7.  | c | 8.  | c | 9.  | c | 10. | d |
| 11. | c | 12. | c | 13. | b | 14  | b | 15. | c | 16. | b | 17. | b | 18. | b | 19. | c | 20. | b |
| 21. | a | 22. | c | 23. | b | 24. | c | 25. | a |     |   |     |   |     |   |     |   |     |   |

## Chapter 13: Electric Current and Its Effects

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | a | 2.  | c | 3.  | d | 4.  | c | 5.  | d | 6.  | b | 7.  | b | 8.  | d | 9.  | a | 10. | c |
| 11. | a | 12. | a | 13. | d | 14  | a | 15. | a | 16. | a | 17. | b | 18. | c | 19. | b | 20. | b |
| 21. | d | 22. | d | 23. | c | 24. | c | 25. | a |     |   |     |   |     |   |     |   |     |   |

## Chapter 14: Light

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | a | 2.  | b | 3.  | d | 4.  | a | 5.  | a | 6.  | c | 7.  | c | 8.  | a | 9.  | a | 10. | b |
| 11. | b | 12. | c | 13. | b | 14  | d | 15. | b | 16. | a | 17. | c | 18. | d | 19. | c | 20. | d |
| 21. | d | 22. | c | 23. | b | 24. | d | 25. | b |     |   |     |   |     |   |     |   |     |   |

## Chapter 15: Logical Reasoning

|     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |     |   |
|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|-----|---|
| 1.  | c | 2.  | a | 3.  | b | 4.  | b | 5.  | a | 6.  | b | 7.  | c | 8.  | b | 9.  | b | 10. | c |
| 11. | d | 12. | d | 13. | c | 14  | b | 15. | c | 16. | b | 17. | b | 18. | b | 19. | a | 20. | d |
| 21. | a | 22. | b | 23. | a | 24. | c | 25. | b | 26. | b | 27. | d | 28. | b | 29. | c | 30. | c |
| 31. | b | 32. | d | 33. | b | 34. | a | 35. | c | 36. | a | 37. | b | 38. | c | 39. | d | 40. | c |

## My Notes

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