



- c) air  
d) land
7. Which hormone controls metamorphosis in frogs? [1]  
a) Thyroxin  
b) Insulin  
c) Adrenal  
d) Growth hormone
8. In the male human, sperm contains 22 pairs of autosomes and [1]  
a) A pair X- chromosome  
b) One Y-chromosome  
c) A pair of Y-chromosome  
d) Three X-chromosome
9. Two objects repel each other. This repulsion could be due to [1]  
a) magnetic force only  
b) electrostatic force only  
c) either a magnetic or an electrostatic force  
d) frictional force only
10. The surface of mortar and pestle (silbatta) used for grinding is etched again after long use to \_\_\_\_\_ friction. [1]  
a) increase  
b) decrease  
c) remove  
d) keep same
11. Rolling friction is smaller than? [1]  
a) Fluid friction  
b) All of these  
c) Static friction  
d) Sliding friction
12. Pitch of sound is determined by its [1]  
a) Loudness  
b) Frequency  
c) Speed  
d) Amplitude
13. Solution of acids are generally [1]  
a) Good conductor of heat  
b) Good conductor of electricity  
c) Super conductor of electricity  
d) Poor conductor of electricity
14. To protect tall building from the damage of lightning, what should be done? [1]  
a) Have a roof top garden with tall tree  
b) Installing antenna at roof-top  
c) Installing a large dish antenna  
d) Install lightning conductor
15. The human eye forms the image of an objects at its [1]  
a) pupil  
b) iris  
c) retina  
d) cornea

### Section B

16. What are the different tips for the saving of petrol/diesel? [2]
17. What are the ill-effects due to the increasing consumption of fuel? [2]
18. Some tribals depend on the jungle. How? [2]
19. Write note on: Adam's apple. [2]
20. A girl is pushing a box towards east direction. In which direction should her friend push the box so that it moves faster in the same direction? [2]
21. When the free ends of a tester are dipped into a solution, the magnetic needle shows deflection. Can you explain [2]

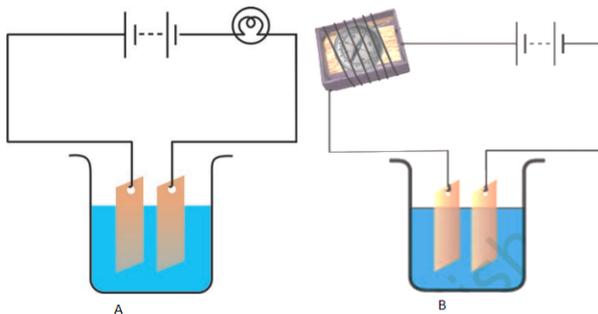
the reason.

22. Here are given capital letters of the English Alphabet encircle the letters which will not show lateral inversion on facing a plane mirror. [2]

A	B	C	D	E	F
G	H	I	J	K	L
M	N	O	P	Q	R
S	T	U	V	W	X
Y	Z				

### Section C

23. Explain nitrogen cycle with a schematic diagram. [4]
24. Describe the formation of petroleum? [4]
25. What is fertilization? Explain the different types of fertilization with example. [4]
26. It is believed that the height of a child depends upon the genes inherited from parents. However, it is often seen that tall parents may have short children and vice-versa. Are there factors other than genes, that can cause these variations? [4]
27. a. How does the pressure of a liquid depend on its depth? [4]  
b. Explain why, the walls of a dam are thicker near the bottom than at the top?
28. It is more difficult to pull a boat than on the sea. Why? [4]
29. Write the applications of the ultrasound. [4]
30. Observing that the bulb does not glow in the circuit shown in figure A, Boojho changed the circuit as shown in figure B. He observed deflection in the magnetic compass. [4]

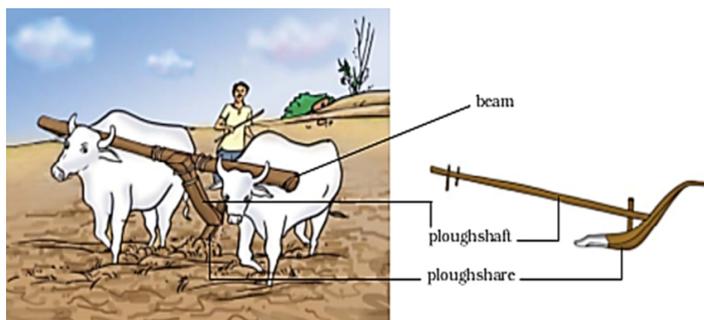


- i. What does the deflection in the magnetic compass indicate?
- ii. Why did the bulb not glow in figure A?
- iii. What would be the effect of the increase in the number of turns in the coil wound around the magnetic compass in figure B?
- iv. What will be observed if the number of cells are increased in the circuit shown in fig B?
31. Explain how lightning takes place? [4]

### Section D

32. Read the text carefully and answer the questions: [5]

The preparation of the soil is the first step before growing a crop. One of the most important tasks in agriculture is to turn the soil and loosen it. This allows the roots to penetrate deep into the soil.







# Solution

## Section A

1. (c) Hoe  
**Explanation:** Hoe
2. (a) algae  
**Explanation:** Algae is autotrophic filamentous microbes living in water or moist soil. Algae contain chlorophyll that is necessary for photosynthesis.
3. (a) conversion of dead vegetation into coal.  
**Explanation:** The slow process of conversion of dead vegetation into coal is called carbonization.
4. (c) hydrogen  
**Explanation:** Hydrogen get maximum amount of heat released during its combustion, calorific value is a measure of a fuel's energy density, and is expressed in energy (Joules) per specified amount (e.g., Kilograms).
5. (d) severe drought  
**Explanation:** One of the natural causes of deforestation is severe drought. Other natural causes as hurricanes, fires, parasites and floods, climate change and overpopulation.
6. (a) all of these  
**Explanation:** We need to conserve forest because it-
  1. Releases Oxygen,
  2. Checks air pollution,
  3. Control moisture and prevents water pollution,
  4. Prevents soil erosion and increases soil fertility,
  5. Provides shelter to birds and nest.
7. (a) Thyroxin  
**Explanation:** Metamorphosis is the morphological change in tadpole into adult frog. Metamorphosis requires hormone thyroxin to undergo metamorphosis.
8. (b) One Y-chromosome  
**Explanation:** A human cell contains 22 pairs of autosomes and 2 pairs of sex chromosomes. The sex chromosomes are the X and the Y chromosomes and human females have two X chromosomes while the human males have one X and one Y chromosomes.
9. (b) electrostatic force only  
**Explanation:** When two objects repel each other, this repulsion could be due to either magnetic or electrostatic force. In electrostatic force, similar charges may repel each other. In a magnetic force, similar poles may repel each other.
10. (a) increase  
**Explanation:** After prolonged use, the mortar and pestle (silbatta) loose the roughness due to which frictional force reduces and it does not work. So, we have to make it rough again for increase friction.
11. (b) All of these  
**Explanation:** All of these
12. (b) Frequency  
**Explanation:** The number of vibration per second is called frequency. The pitch of sound depends upon frequency of sound.

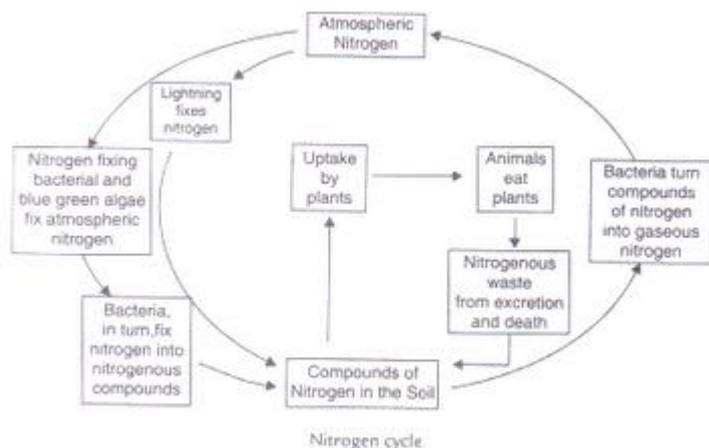
13. (b) Good conductor of electricity  
**Explanation:** Solution of acid when dissociates in water produces free ions that help in flowing of electric current. Hence, solution of acids is good conductor of electricity.
14. (d) Install lightning conductor  
**Explanation:** To protect the tall building from the damage of lightning, lightning conductor should be installed at the top of the building so that it can attract free flowing ions and pass them down to the earth. If the lightning strikes, it will hit the top of the lightning conductor rather than the building and gets discharged safely into the ground through the buried metal plate.
15. (c) retina  
**Explanation:** retina

### Section B

16. Petroleum Conservation Research Association, advises people to save petrol/diesel, in the following ways.
- Drive at a constant and moderate speed.
  - Switch off the engine at traffic lights or when have to wait.
  - Ensure correct tyre pressure.
  - Ensure regular maintenance of the vehicle.
17. **Harmful effects of using more fuels:**
- Carbon fuels like wood, coal and petroleum release unburnt carbon particles. These fine particles create respiratory disorders and diseases like asthma.
  - Incomplete combustion of these fuels gives carbon monoxide. It is very harmful gas and causes respiratory disorders. It can kill persons sleeping in that room.
  - Excessive use of fuels causes global warming.
  - They cause acid rain which is harmful for crops, buildings and soil.
18. Tribal people have been living in or around the jungle since ages. They take many forest produce for their day to day needs. For example; they use firewood as kitchen fuel, bamboo to make house and many useful items, medicinal plants to treat diseases, etc. They also take various items from forest to sell them into the market; in order to earn some money. Thus, tribals depend on the jungle in a significant way.
19. At puberty, the voice box or the larynx begins to grow. Boys develop larger voice boxes. The growing voice box in boys can be seen as a protruding part of the throat called Adam's apple. In girls the larynx is hardly visible from the outside because of its small size. Generally, girls have a high pitched voice, whereas the boys have a deep voice.
20. Her friend should push the box to the east so that it moves faster in the same direction because:
- If her friend pushes the box in the east direction, the magnitude of the force increases.
  - As a result, the box will move faster.
21. The compass needle shows a deflection which concludes that current is flowing through the wire. The circuit becomes complete as the free ends of the tester are immersed inside the solution. So, the solution is conducting solution and that is the reason why a deflection is obtained in the compass needle.
22. (A) B C D E F  
 G (H) (I) J K L  
 (M) N (O) P Q R  
 S (T) (U) (V) (W) (X)  
 (Y) Z

### Section C

23. Certain bacteria and blue-green algae present in the soil fix the atmospheric nitrogen and convert it into compounds of nitrogen. These can be utilised by plants by taking them from the soil through their root system. Nitrogen is then used for the synthesis of the plant proteins and other compounds. Animals use these proteins and other nitrogen compounds as food. When animals and plants die, bacteria and fungus present in the soil convert these nitrogenous waste into usable nitrogen compounds which are used by plants again. Some other bacteria convert some part of them to free nitrogen gas which goes back into the atmosphere. As the result percentage of nitrogen in the atmosphere remains constant.



24. Petroleum (also known as crude oil or simply oil) is a fossil fuel that was formed from the remains of ancient marine organisms. When small sea plants and animals die they will sink, they will then lie on the sea bed where they will decompose and mix with sand and silt. During the decomposition process tiny bacteria will clean the remains of certain chemicals such as phosphorus, nitrogen and oxygen. This leaves the remains consisting of mainly carbon and hydrogen. At the bottom of the ocean there is insufficient oxygen for the corpse to decompose entirely. What we are left with is the raw materials for the formation of petroleum.

25. The fusion of male gamete with a female gamete to form a zygote during sexual reproduction is called fertilisation..

The first step in the process of reproduction is the fusion of a sperm and an ovum.

During fertilization nuclei of the sperm and the egg fuse to form a single nuclei.

The different types of fertilization are as follows:-

- o **Internal fertilization**:- fertilization which takes place inside the female body. It usually occurs in animals including humans and cows etc.
- o **External fertilization**:- fertilization which takes place outside the female body. Usually in this case lots of gametes are released at a time. Usually occurs in frogs etc.

26. The height of a child depends upon the genes inherited from parents. However, there are some other factors also that can affect height. These factors include a balanced diet, hormones, exercise, and diseases. A balanced diet is essential for adolescents as it helps the bones, muscles, and other parts of the body to get adequate nourishment for growth. Similarly, lack of hormones as growth hormones may lead to dwarfism. Regular exercise is also essential for healthy muscles, bones, and joints and their proper development. Lack of disease is a priority for growth that is related to other factors listed above.

Thus, height depends on a combination of various factors and the absence or deficiency of any one of them can cause variations.

This is why tall parents may have short children and vice-versa.

27. a. The pressure of the liquids is not same at all depths. It changes with the depth.

The pressure exerted by a liquid increases with increasing depth inside the liquid. As the depth increases, the weight of liquid column pushing down from above increases and hence the pressure increases too.

b. The walls of a dam are thicker at the bottom because the pressure exerted at the bottom is more than the top, so to bear the pressure and the weight of the liquid, the walls are made thicker.

28. It is difficult to pull the boat on the beach because of the friction between the boat and sand. But in the sea, there is less friction between the sea water and the boat. Hence, it is easier to pull the boat in the sea.

29. (i) Ultrasound is used as diagnostic tool in medical science.

(ii) It is used to relieve pains in joints and muscles.

(iii) It is used to detect flaws in metals and structures.

(iv) It is used to test the thickness of various parts.

(v) In the process of electrocardiography, the ultrasonic waves are used to form an image of the heart using reflection and detection of these waves from various parts.

(vi) Medical ultrasound is a diagnostic imaging technique based on ultrasound.

(vii) Ultrasonic waves are used to break stones in the kidney.

30. i. It shows that current is present in the circuit.

ii. The bulb didn't glow as the current required was less than the current flowed in the circuit.

iii. In the magnetic compass, the deflection will increase.

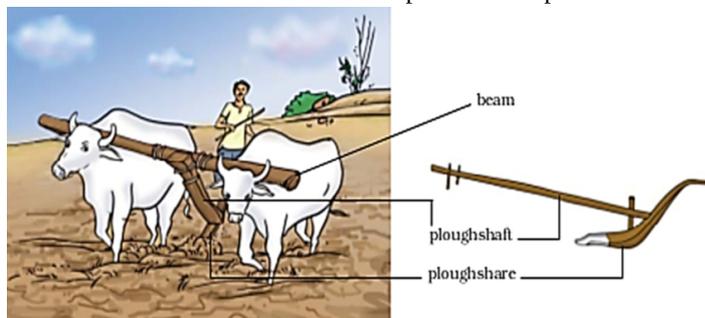
iv. In the magnetic compass, the deflection will keep increasing.

31. During the development of a thunderstorm, the air currents move in an upward direction while the water droplets move in a downward direction. These movements cause separation of charges. The positive charges collect near the upper edges of the clouds and negative charges collect near the lower edges of the clouds. Accumulation of positive charges near the ground also takes place. When the magnitude of collected charges becomes large, the air cannot resist their flow and as a result, negative and positive charges meet producing streaks of bright light and sound, called lightning.

#### Section D

32. **Read the text carefully and answer the questions:**

The preparation of the soil is the first step before growing a crop. One of the most important tasks in agriculture is to turn the soil and loosen it. This allows the roots to penetrate deep into the soil.



- (i) (c) All of these

**Explanation:** All of these

- (ii) (d) plough shaft

**Explanation:** plough shaft

- (iii) (d) Both removing weeds and for loosening the soil

**Explanation:** Both removing weeds and for loosening the soil

- (iv) 1. ploughing

- (v) (a) True

**Explanation:** True

33. **Read the text carefully and answer the questions:**

There is fire caught in the neighbour's house of Anita so she went there and take some measure. She calls the fire brigade and then gathered people to pour the water. Water cools the combustible material so that its temperature is brought below its ignition temperature. This prevents the fire from spreading. Water vapours also surround the combustible material, helping in cutting off the supply of air. So, the fire is extinguished.

- (i) (d) CO<sub>2</sub>

**Explanation:** CO<sub>2</sub>

- (ii) (a) water

**Explanation:** water

- (iii) (c) all of these

**Explanation:** all of these

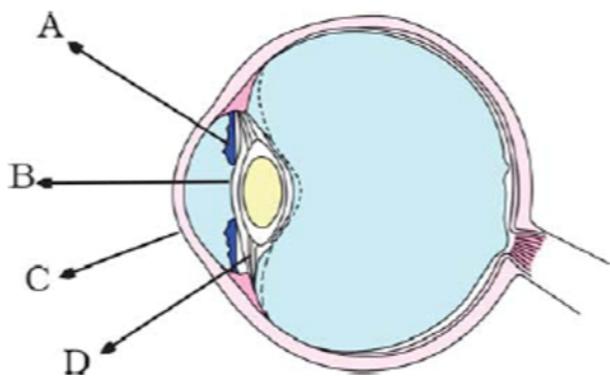
- (iv) 1. Sodium bicarbonate

- (v) (a) True

**Explanation:** True

34. **Read the text carefully and answer the questions:**

We see things only when light coming from them enters our eyes. Eye is one of our most important sense organs. The eye has a roughly spherical shape. Outer coat of the eye is white. It is tough so that it can protect the interior of the eye from accidents.



(i) **(b)** Iris

**Explanation:** Iris

(ii) **(b)** both cones and rods

**Explanation:** both cones and rods

(iii) **(c)** Cornea

**Explanation:** Cornea

(iv) 1. retina

(v) **(a)** True

**Explanation:** True