

SECTION-A

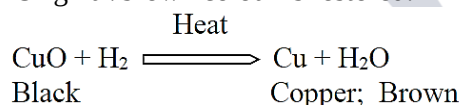
1. Cyclopentene / Cyclohexene-formula or structure (or any other).
 2. Electromagnetic Induction
 3. (a) Thick hair growth in armpits, genital area/thinner hair on arms, legs, face/ more active oil secretion from glands on skin/Occurrence of pimples (any two)
(b) Imbalance in male - female ratio/ decline in child sex ratio
(c) Oral pills
(d) Rate of birth and death
 4. (a) Human beings are at the top level in any food chain
(b) Washing of vegetables, fruits, grains thoroughly/Organic farming/ Use of bio pesticides (any one)
(c) (ii)
(d) (i)
 5. (d)
- OR**
- (d)
 6. (d)
 7. (c)
 8. (c)
 9. (d)
- OR**
- (d)
 10. (d)
- OR**
- (d)
 11. (d)
 12. (b)
 13. (b)
 14. (a)

SECTION-B

15. - A black colour is formed on the surface

$$\underset{\text{Brown}}{2\text{Cu} + \text{O}_2} \xrightarrow{\text{Heat}} \underset{\text{Copper Oxide; Black Colour}}{2\text{CuO}}$$

- Original/brown colour is restored.



16. Products: Hydrogen, Chlorine, Sodium hydroxide

Uses:

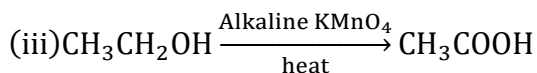
Hydrogen: In the production of margarine/ ammonia/as a fuel Chlorine: Water treatment/ swimming pools/ production of PVC/ Disinfectants/CFCs/Pesticides.

Sodium hydroxide: For degreasing metal surfaces/ in making soaps and detergents/ paper making/ artificial fibres. (any one use of these or any other)

OR

- By recrystallisation of sodium carbonate
- $\text{Na}_2\text{CO}_3 + 10\text{H}_2\text{O} \rightarrow \text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$
- Basic Salt
- Permanent hardness

17. (i) By dissolving 5g of KMnO_4 in 100 mL of water/
By dissolving 5g of KMnO_4 in water to make a final volume of 100 mL .
(ii) As an oxidizing agent
Purple colour persists



18. - The adrenaline hormone is secreted into the blood.

- The heart beats faster resulting in supply of more oxygen to the muscles.
- Blood is diverted to skeletal muscles.
- The breathing rate increases.
- The blood supply to digestive systems and skin is reduced.

OR

- Electrical impulses have limited access to only those cells that are connected by nervous tissue/ neurons, whereas chemical signals can reach each and every cell of the body .
- Cells need time to reset in order to create repeated/ new electrical impulses whereas no such time is required for chemical communication.

19. Pollination is the transfer of pollen from anther to stigma

Self Pollination	Cross Pollination
Transfer of pollen in the same flower	Transfer of pollen from one flower to another.

- Pollination leads to fertilization resulting in the formation of zygote.

20. - Homologous structures are those which have similar basic structure and origin but perform different functions.

- Example: forelimbs of reptiles, amphibians, humans, wings of birds (or any other example)
- Yes
- Similarity in basic design of the structure indicates that their ancestors were common.

21. Because of scattering of light.

Instances:

- When a fine beam of light enters a smoke-filled dark room through a small hole.
- When sunlight passes through a canopy of dense forest in foggy/ misty conditions.
- Blue colour of sky.
- Red colour of the sun during sunrise or sunset. (or any other)

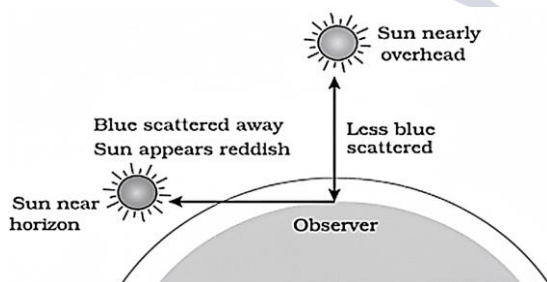
OR

- Prism has 2 inclined refracting surfaces whereas a glass slab has 2 parallel refracting surfaces.

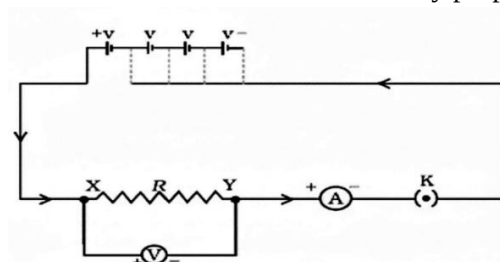
(i) When monochromatic light passes through a glass slab it gets displaced laterally whereas in prism it gets angularly displaced.

(ii) When white light passes through a glass slab, it gets laterally displaced whereas in prism, dispersion takes place.

22.



23. $V \propto I$ or Potential difference is directly proportional to current



24. (i) $H = I^2 R t$

$$H = V.I.t$$

$$= V \cdot Q$$

(ii) Given : $V = 40$ volts , $Q = 96000$ C

$$H = 40 \text{ V} \times 96000 \text{ C}$$

$$= 3.84 \times 10^6 \text{ J}$$

SECTION-C

25. - These metals have more affinity for oxygen than carbon.

- Towards the top of the reactivity series .
- By electrolytic reduction of their molten ores.
- Example: Extraction of sodium from molten sodium chloride by electrolysis.

Process:

- Molten NaCl is taken in an electrolytic cell and on passing electricity Na is deposited at cathode and chlorine is liberated at anode .

Reactions - At cathode - $\text{Na}^+ + \text{e}^- \rightarrow \text{Na}$

At anode - $2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^-$ (or any other example)

26. (i) E, it has 4 valence electrons.

(ii) B, it needs only 2 electrons to attain stable configuration.

(iii) D , it loses two electrons to attain stable configuration.

(iv) F , it has the largest size since size increases down the group.

(v) Noble gases, outermost shell is complete.

OR

- Atomic size is the distance between the centre of the nucleus and the outermost shell of an isolated atom.

- Picometer /pm

- Trends in Atomic radius

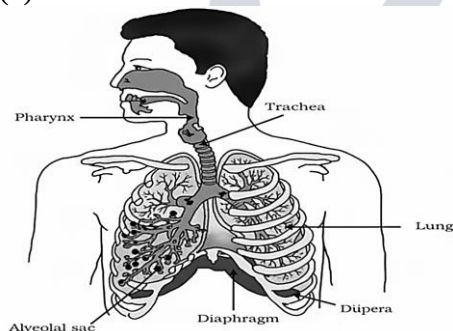
In a group: increases down the group; due to addition of a new shell .

In a period: atomic radius decreases from left to right;

due to increase in pulling power of nucleus / due to addition of electrons in the same shell.

27. (a) Rate of breathing is faster in aquatic organisms because the amount of dissolved oxygen in water is lower as compared to the amount of oxygen in air.

(b)



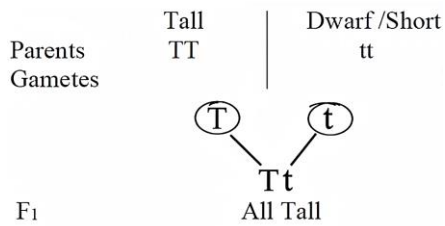
OR

(a) A pair of kidneys, a pair of ureters, a urinary bladder and a urethra.

(b) A kidney has a large number of filtration units called nephrons. Each nephron has cup shaped Bowman's capsule containing a bunch of capillaries called glomerulus. Blood gets filtered in the glomerulus. Filtrate gets collected in Bowman's capsule. Some useful substances such as glucose, amino acids, salts and water are selectively reabsorbed as urine flows through nephron tube. The urine formed in each kidney is eventually stored in the urinary bladder

28. (a) Law of dominance of traits: -In a cross between a pair of contrasting characters, only one parental character will be expressed in F1 generation which is called dominant trait and the other is called recessive trait.

For example - in pea plants,



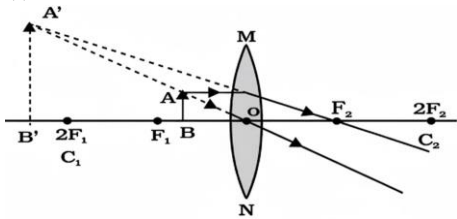
All plants in F₁ generation were tall proving that the gene for tallness is dominant over the gene for dwarfness/short, which is not able to express itself in the presence of dominant trait.

(any other example)

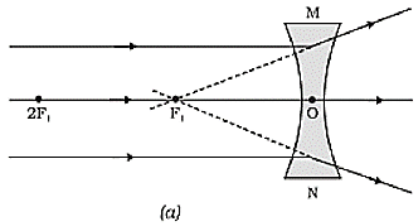
(b) Traits acquired by an organism during its lifetime are known as acquired traits.

These traits are not inherited because they occur in somatic cells only/do not cause any change in the DNA of the germ cells.

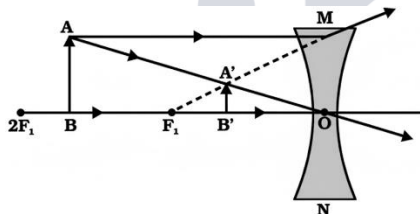
29. (i)



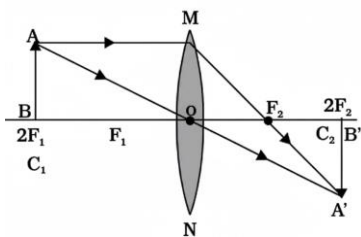
(ii)



OR



(iii)



In case (i) sign is positive and $m > 1$

(ii) sign is positive and $m < 1$

OR

Given $h = +4.0$ cm, $u = -25.0$ cm, $f = -15.0$ cm

(i) image distance $v = ?$; mirror formula :

$$\frac{1}{v} + \frac{1}{u} = \frac{1}{f} \quad \text{or} \quad \frac{1}{v} = \frac{1}{f} - \frac{1}{u}; = -\frac{1}{15} - \left(-\frac{1}{25}\right)$$

$$= \frac{-1}{15} + \frac{1}{25} = \frac{-5 + 3}{75}$$

$$= \frac{-2}{75}$$

$$v = -37.5 \text{ cm}$$

The screen should be placed 37.5 cm in front of the mirror.

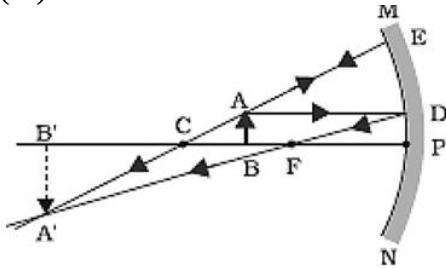
$$(ii) m = \frac{h^1}{h} = -\frac{v}{u}$$

$$h^1 = -\frac{v}{u} \cdot h$$

$$= -\frac{(-37.5 \times 4)}{-25}$$

$$h^1 = -6.0 \text{ cm (size of the image)}$$

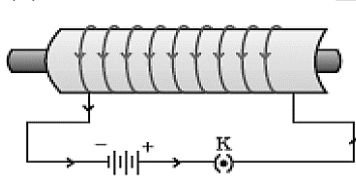
(iii)



30. (a) A current carrying solenoid is called an electromagnet /when soft iron is placed inside a solenoid carrying current, the soft iron piece behaves like a magnet so long as electric current passes through it. The magnet so formed is electromagnet.

Uses: In electric motors, electric bells, (or any other)

(b)



(Direction of current)

(c) Soft iron core is used to increase the strength/power of the electro magnet.

(d) (i) By increasing the current.

(ii) By increasing the number of turns in the coil.