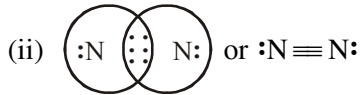


SECTION-A

1. (i) Nitrogen.



2. (i) Na has largest atomic radius because it has 11 protons and 11 electrons and least effective nuclear charge among these elements.

(ii) Al is least reactive because it is smallest in size, therefore, has most effective nuclear charge, least tendency to lose electrons.

3. (a) Uterus is the site of implantation and development of the baby.

(b) Seminal vesicles and prostate gland provide fluid to the semen.

4. (a) The process by which a new plant grows and develops from a seed into a seedling under appropriate conditions is called germination. During germination various parts of seeds are formed that protect the growing embryo like seed coat.

(b) The part labelled incorrectly are:

(i) Male germ cells- Should be pollen grain]

(ii) Pollen grain- Male germ cells

(iii) Ovule- Should be the ovary

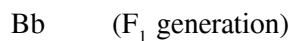
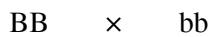
5. Yes it is possible that a trait is inherited but may not be expressed.

For example when pure tall pea plants are crossed with pure dwarf pea plants only tall pea plants are obtained in F_1 generation on selfing, both tall & dwarf plants are obtained in F_2 generation in ratio 3 : 1.

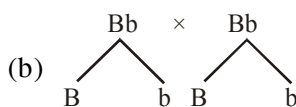
If the dwarf character is recessive trait in F_2 generation shows that the dwarf trait was present in individuals of F_1 but it did not express.

OR

(a) Blue colour \times White colour



The colour of the flower in F_1 generation will be blue.



	B	b
B	BB	Bb
b	Bb	bb

Phenotypic Ratio- 3 : 1 (blue : white)

Genotypic Ratio- 1 : 2 : 1

If flowers of F_1 generations are self pollinated, then the percentage of white flowers in F_2 generation must be 25%.

6. Let the areas of two wires be A_1 and A_2 , where

$$\frac{A_1}{A_2} = \frac{8}{5} \quad (\text{given}), \text{ which indicates that wire of area } A_1 \text{ is thicker.}$$

Given, resistance R_1 of wire of area $A_1 = 10 \Omega$

As both the wires are of same material and same length, hence resistivity ρ will be same for both of them and length $l_1 = l_2 = l$ (say)

Now,

$$\frac{R_1}{R_2} = \frac{\left(\frac{\rho l}{A_1}\right)}{\left(\frac{\rho l}{A_2}\right)} = \frac{\rho l}{A_1} \times \frac{A_2}{\rho l} = \frac{A_2}{A_1} = \frac{5}{8} \quad \left(\because R = \rho \frac{l}{A}\right)$$

$$\Rightarrow \frac{10}{R_2} = \frac{5}{8} \quad \text{or} \quad R_2 = \frac{80}{5} = 16 \Omega$$

OR

$$R_{AB} = 2\Omega + 6\Omega \parallel 3\Omega$$

$$= 2 + \frac{6 \times 3}{6 + 3} = 2 + \frac{18}{9} = 2 + 2 = 4 \Omega$$

7. Removal of lions from the given food chain will increase the number of deer to such an extent that they will eat up the whole grass. The density of producer like grass will be very much reduced and this will turn the area into a desert.

OR

The concentration of pesticide will increase with the rise of trophic level in the food chain due to Biomagnification.

Biomagnification is the process of accumulation of non biodegradable chemicals (Pesticides) into the body of organisms through the food chain which increases at each trophic level.

So highest amount of pesticide will be in Big fish.

SECTION-B

8. (i) It is because carbon has four valence electrons, it cannot gain or lose four electrons because high energy is needed. It can only share four electrons.
- (ii) It is due to strong covalent bonds and compact structure of diamond.
- (iii) It is due to presence of free electrons in graphite because each carbon is linked to three more carbon atoms.

9. (i) $_{10}\text{Ne}$ has electronic configuration 2, 8. 1st and 2nd shells are completely filled.
(ii) $_{3}\text{Li}$ and $_{11}\text{Na}$ belong to same group of periodic table, i.e. 1st group.

OR

- (i) The phenomenon in which compounds have same molecular formula but different structures is called isomerism.
(ii) Propane do not show isomerism because it cannot have a branched chain structure to exhibit isomerism.
(iii) Two – (a) n-Butane
(b) Isobutane.
10. Let the dominant trait be represented by PP.
Let the recessive trait be represented by pp.
Parents PP × pp

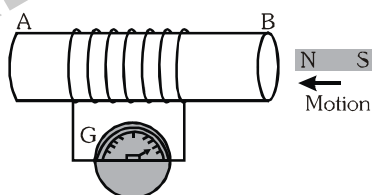
F₁ - generation (Pp) (Pp) (Pp) (Pp), i.e., all pink colour flowers, but hybrid.

Parents self fertilised Pp × Pp

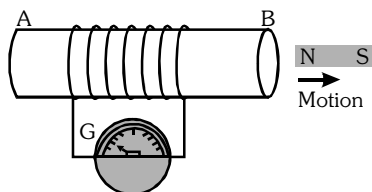
F₂ - generation (PP) (Pp) (Pp) (pp)

Ratio 3 pink colour flowers : 1 white colour flower.

11. (i) Take a coil AB of conducting wire wound on a cylindrical support and connect it to a sensitive galvanometer and take a bar magnet NS.
(ii) Now move the bar magnet towards the coil with its north pole facing towards the coil. A deflection in the needle of the galvanometer will be observed which indicates the flow of current in the coil.



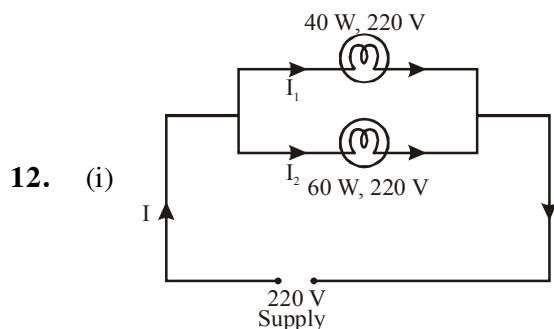
- (iii) When the north pole of the magnet is moved away from the coil, again a deflection is observed in the galvanometer but in reverse direction. This indicates that a current is flowing in the circuit but in opposite direction than before.



- (iv) Similarly, if the south pole of the bar magnet is facing the coil and it is moved towards or away from the coil, deflections will be observed in the galvanometer but they will be just opposite to that observed in the previous case.

- (v) If the coil is moved towards or away from the magnet (keeping the magnet at rest), the similar effect can be seen in the coil. When the coil and the magnet both are at rest, no deflection is observed in the galvanometer.

Lenz's law is used to find the direction of electric current thus generated in the coil.



- (ii) Current drawn by 40 W bulb,

$$I_1 = \frac{P}{V} = \frac{40}{220} \text{ A} = \frac{2}{11} \text{ A} = 0.18 \text{ A}$$

Current drawn by 60 W bulb,

$$I_2 = \frac{P}{V} = \frac{60}{220} = \frac{3}{11} \text{ A} = 0.27 \text{ A}$$

Total current drawn from circuit,

$$I = I_1 + I_2 = 0.18 \text{ A} + 0.27 \text{ A} = 0.45 \text{ A}$$

- (iii) Energy consumed by 40 W bulb in 1 hour

$$= P \times t = 40 \text{ W} \times 1 \text{ h} = 40 \text{ Wh}$$

Energy consumed by 60 W bulb in 1 hour

$$= 60 \text{ W} \times 1 \text{ h} = 60 \text{ Wh}$$

$$\therefore \text{Total energy consumed} = 40 \text{ Wh} + 60 \text{ Wh} \\ = 100 \text{ Wh} = 0.1 \text{ kWh}$$

OR

- (i) (a) Slope $\frac{V}{I} = \text{Resistance (R)}$

As larger resistance represents series combination and smaller resistance the parallel combination. Therefore, V-I graph of greater slope represents series combination and hence it is correctly labelled.

- (b) Slope, $\frac{I}{V} = \frac{1}{R}$

As larger resistance represents series combination, so I-V graph of smaller slope represents series combination and hence it is also correctly labelled.

- (ii) Resistivity of a conductor depends upon :

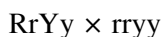
- Nature of material of conductor.
- Temperature.

13. (i) Naman explained the health hazards of using DDT on our environment and other animals to farmers, i.e.
- DDT is a non-biodegradable substance.
 - DDT could enter into a food chain and in due course of time everyone associated would be affected due to its accumulation in the body.
- (ii) Biomagnification refers to increase in concentration of the toxicant at successive trophic levels. This happens because a toxic substance accumulated by an organism cannot be metabolised or excreted and is thus passed onto the next higher trophic level.

SECTION-C

14. (a) A-B type of seeds are round-yellow.
 (b) A-D type of seeds are round & green.
 C-B type of seeds are wrinkled & yellow.
 (c) Phenotype ratio - 9 : 3 : 3 : 1 and Genotype ratio-1 : 2 : 2 : 4 : 1 : 2 : 1 : 2 : 1

OR

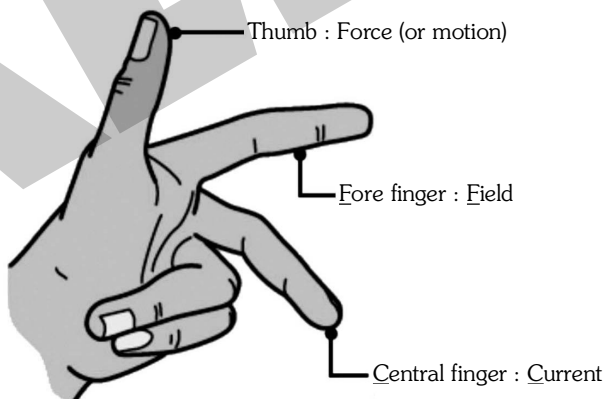


	RY	Ry	ry	rY
ry	RrYy	Rryy	rryy	rrYy

Phenotype ratio is 1 : 1 : 1 : 1

15. (a) **Fleming's left-hand rule**

The direction of force on a current-carrying conductor is given by Fleming's left-hand rule. According to this rule, 'stretch the thumb, forefinger and central finger of your left hand such that they are mutually perpendicular. If the fore finger points in the direction of magnetic field and the central finger in the direction of current, then the thumb will point in the direction of motion or the force acting on the conductor.'



- If the current through rod PQ is reversed (i.e. direction of current be from South to North), the rod will deflect towards West (i.e. Left side).
- If a resistor is connected in series with the rod PQ, the effective (net) resistance of the electric supply circuit would increase, thereby reducing the magnitude of current flowing through the rod. Thus, the deflection of rod will decrease.

OR

If the horseshoe magnet is replaced by a U-shaped electromagnet, the deflection of current carrying rod PQ can be increased by :

- Increasing the number of turns in electromagnet.
- Increasing the magnitude of current flowing through electromagnet.