LIBERTY PAPER SET

STD. 10 : Science [N-011(E)]

Full Solution

Time : 3 Hours **ASSIGNTMENT PAPER 5**

Section-A

1. (B) Na **2.** (C) Ketone **3.** (B) $C_6H_{12}O_6$ **4.** (B) 80 cm **5.** (C) 25 cm **6.** (C) Biological Magnification **7.** C_nH_{2n+2} **8.** 4Ω **9.** 23 **10.** gene **11.** Skin **12.** Yellow **13.** True **14.** True **15.** False **16.** True **17.** False **18.** False **19.** It changes focal length of pupil. **20.** Mitoclondria **21.** $CaOCl_2$ **22.** Ammeter **23.** (c) Gibberellin **24.** (a) Abscisic Acid

Section-B

25. **(a) Barium Chloride + Aluminium Sulphate → Barium Sulphate + Aluminium Chloride**

- **Skeletal Equation :**
- $BaCl_2(aq) + Al_2(SO_4)_3 \rightarrow BaSO_4 + AlCl_3$
- **Balanced Equation :**
- $3BaCl_2 + Al_2(SO_4)_3 \rightarrow 3BaSO_4 + 2AlCl_3$

(c) Hydrogen + Chlorine → Hydrogen Chloride

- $H_2 + Cl_2 \rightarrow 2HCl$

26. **The common properties of metals are listed below:**

(i) Metals in their pure state, have a shining surface.
(ii) They are hard and solid in nature.
(iii) They have characteristic of ductility.
(iv) They have characteristic of malleability.
(v) Metals are good conductors of electricity and heat.
(vi) Metals have high melting point.
(vii) Metals produce ringing sound.

27.

- Plants consume water for their life processes; however, they do not utilize it completely. The excess water is expelled through the process of transpiration.
- Other excretory wastes get accumulated in the cell vacuoles, eventually forming resin and gum. This is usually observed in old xylem tissues. Some of these wastes are stored in the leaves which later droop and wither away.
- Carbon dioxide or gaseous wastes are eliminated through stomata.
- Some other forms of wastes can be excreted into the soil. Excretory products can also be stored as oils and latex in the barks of trees.

28.

- New thick hair growth on the face.
- Voice begins to crack.
- The penis occasionally begins to become enlarged and erect.

29.

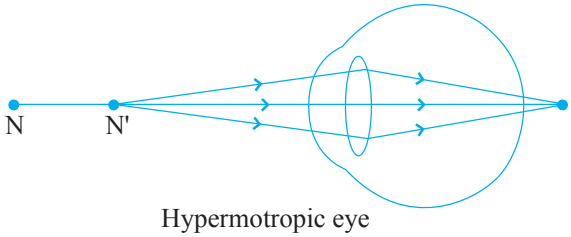
- In multi-cellular organisms with relatively simple body organization, simple reproductive methods can still work.
- For example - Spirogyra : simply breaks up into smaller pieces upon maturation.
- These pieces grow into new individuals.
- This is not true for all multi-cellular organism.
- They cannot divide cell by cell.

- The reason is that many multi-cellular organism, are not simply a random collection of cells.
- Specialized cells are organized as tissues, and tissues are organized into organs, which then have to be placed at definite positions in the body.
- In such a carefully organized situation, cell by cell division would be impractical.
- Therefore, multi-cellular organism need to use more complex ways for reproduction.

30. - It is a kind of a defect in the human eye due to which, a person can see distant objects properly but cannot see the nearby objects clearly. It happens due to :

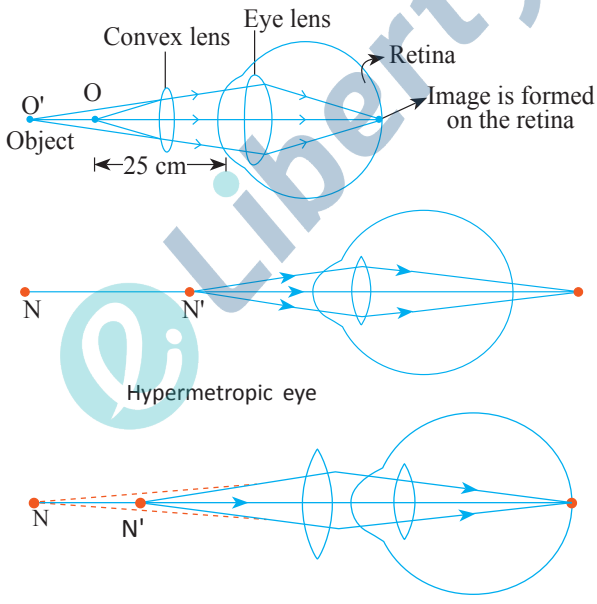
(1) Decrease in the power of eye lens i.e., increase in focal length of eye lens.

(ii) Shortening of eye ball.



Hypermotropic eye

- A hypermetropic eye has its least distance of distinct vision greater than 25 cm.
- **Correction**
- Since a convex lens has the ability to converge incoming rays, it can be used to correct this defect of vision, as you already have seen in the animation. The ray diagram for the corrective measure for a hypermetropic eye is shown in the given figure.



Correction for Hypermetropic eye

31. - H = 100J, R = 4Ω, t = 1s, V = ?
- We have the current through the resistor as $I = \sqrt{(H/Rt)} = \sqrt{[100\ J/(4\Omega \times 1\ s)]} = 5\ A$
- Thus the potential difference across the resistor, V
- $V = IR = 5A \times 4\Omega = 20V$

32. - Unit of current is ampere. If one coulomb of charge flows through any section of a conductor in one second, then the current through it is said to be one ampere.

$I = Q/t$ or $1\ A = 1\ C\ s^{-1}$

33. - (i) The wires used in the circuit must be coated with good insulating materials like PVC, etc.
- (ii) The circuit must be divided into different sections and a safety fuse must be used in each section.
- (iii) High power appliances like air-conditioner, refrigerator, a water heater, etc. should not be used simultaneously.

34. ➤ Ozone (O_3) is an isotope of oxygen, i.e., it is a molecule formed by three atoms of oxygen.

➤ At the higher levels of the atmosphere, ozone performs an essential function. It shields the surface of the earth from ultraviolet (UV) radiations from the sun. These radiations are highly damaging to organisms. Ultraviolet rays can cause skin cancer.

35.

BIODEGRADABLE WASTES	NON-BIODEGRADABLE WASTES
• They can be broken down into non- poisonous substances by the action of microorganisms. • They change their form and structure over time and become harmless. • They do not pollute the environment. • Examples: Spoilt food, vegetable peels, paper, leather etc.	• They cannot be broken down into harmless substances by any biological processes. • They remain unchanged over a long period of time. • They continue to pollute the environment. • Examples: Glass bottles, metal cans, polythene bags, synthetic fibres etc.

36. Saliva is secreted by salivary Grand Presentin in mouth.

➤ Saliva contains an enzyme called salivary emylase. It break down complex molecules of starch into sugar.

➤ In addition saliva makes food wet and fluffy so that food can be swallowed easily.

37. ➤ Field lines arise from North Pole and end into South Pole of the magnet.

➤ Field lines form circular loop.

➤ Field lines are closer in stronger magnetic field.

➤ Field lines never intersect each other as for two lines to intersect; there must be two North directions at a point, which is not possible.

➤ As we go far from magnets, intensity of magnetic field lines gets decreased.

Section-C

38. **(i) Exothermic Reactions :**

➤ The reactions in which heat is released alongwith the formation of products are called exothermic chemical reactions.

➤ **Example :**

➤ (a) Burning of natural gas :

$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

➤ (Methane)

➤ (b) Respiration process is also exothermic :

$C_6H_{12}O_6(aq) + 6O_2(aq) \rightarrow$

➤ $6CO_2(aq) + 6H_2O(l)$ + **Energy**

➤ (Glucose)

➤ (c) The decomposition of vegetable matter into compost is also an example of an exothermic reaction.

➤ **(ii) Endothermic Reactions :**

➤ The reactions in which heat is supplied or absorbed are called endothermic reactions.

➤ **Examples :**

➤ (a) The sweat (produced on the surface of the skin) absorbs heat from the skin to evaporate. It is endothermic.

➤ (b) When ammonium chloride (NH_4Cl) is dissolved in water, an endothermic reaction takes place.

$NH_4Cl(s) + H_2O(l) \rightarrow NH_4Cl(aq) - Heat$

➤ (c) Melting of ice to form water.

➤ (d) Evaporation of liquid water, forming water vapour.

➤ (e) Sublimation of solid CO_2.

➤ (f) The baking of bread.

39. ➤ When a metal is attacked by substances around it such as moisture, acids etc. it is said to corrode and this process is called corrosion.

Examples :

➤ Iron articles are shiny when new, but get coated with a reddish brown powder when left for some time. This process is known as rusting of Iron.

➤ The black coating on silver and the green coating on copper are other examples of corrosion.

➤ corrosion causes damage to car-bodies, bridges, Iton railing, ships and to all objects made of metals.

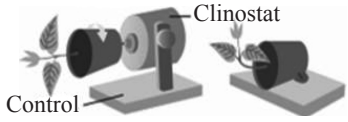
➤ The Methods to prevent corrosion are as follows :

1. Alloying 2. Galvanization 3. Electroplating 4. Painting and greasing.
5. Oiling 6. Anodification

40.

Calcination	Roasting
(i) Carbonate ore is heated in the presence of limited amount of air the ore is converted into oxide. This process is known as calcination.	(i) Sulphide containing ore is heated in more amount of air, it is converted into oxide. This process is known as roasting
(ii) CO_2 gas is generated during calcination process	(ii) SO_2 gas generated during roasting process
(iii) $ZnCO_3 \xrightarrow{Heat} ZnO(s) + CO_2(g)$	(iii) $2ZnS(s) + 3O_2(g) \xrightarrow{Heat} 2ZnO(s) + 2SO_2(g)$

41.

Types of tropic movements	
Phototropism : growth movements induced by light e.g. the growth movement of stem towards sunlight is positive phototropism whereas the growth of roots away from sunlight is called negative phototropism.	
Geotropism : growth movements induced by gravity e.g. growth movement of roots towards gravity is positive geotropism whereas the growth of stem away from gravity is called negative geotropism.	

42. ➤ Methods of Contraception

Mechanical barries :

➤ In this method, sperm does not reach the egg.

➤ Condoms on the penis or similar coverings worn in the vagina can serve this purpose.

➤ The devices such as the loop as the copper-T are placed in the uterus to prevent pregnancy.

Chemical barrier :

➤ In this method a woman uses two kinds of pills oral and vaginal pills. The oral pills are hormonal preparations which supress the release of ovum in fallopian tube.

➤ These are called oral contraceptives.

➤ The vaginal pills/creams are spermicidal The chemical in these spermicidal kills the sperms during their journey in the vaginal tract.

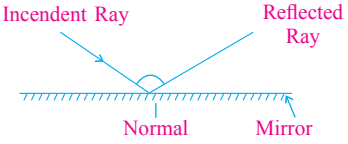
Surgical method :

➤ In this method, a small part of vas-deferens of male and fallopian tube of female is cut or tied by surgery.

- It is called vasectomy in males and tubectomy in females.

43.
- Menstruation occurs when a girl becomes 10 to 12 years old.
- The eggs become mature due to sex hormones.
- After every 28 days one mature egg is released from the ovary into the fallopian tube which is known as ovulation.
- Before ovulation, the uterus; inner wall becomes thickened and spongy with capillaries.
- If there is a fertilization at this stage then the fetus must be nourished.
- If the egg is not fertilized then this lining is not needed any longer.
- So lining slowly breaks and comes out through the vagina as blood and mucous.
- This cycle takes place roughly every month and is known as menstruation.
- It usually lasts for about two to eight days.

44.



- Focal length,
- $f = \frac{R}{2} = +\frac{3.00m}{2} = +1.50$ m
- Using the mirror formula,

$$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$$

$$\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$$

$$= + \frac{1}{1.50} - \frac{1}{(-5.00)}$$

$$= \frac{1}{1.50} + \frac{1}{5.00}$$

$$= \frac{5.00 + 1.50}{7.50}$$

$$v = \frac{+7.50}{650}$$

$$= + 1.15 \text{ m}$$

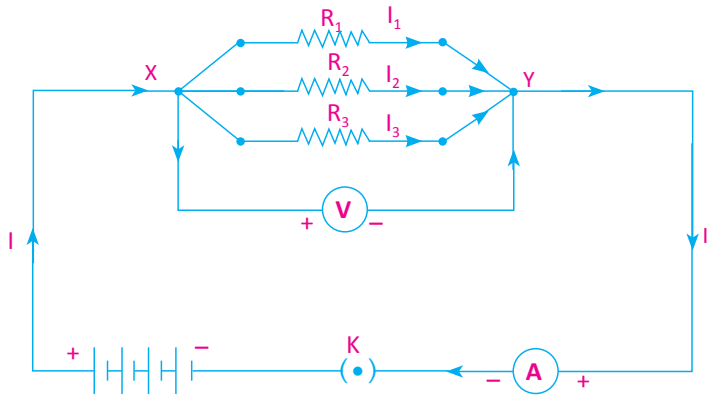
- Magnification, $m = \frac{h'}{h} = -\frac{v}{u}$

$$= \frac{1.15m}{-5.00m}$$

$$= + 0.23$$

45.
- The laws of reflection determine the reflection of incident light rays on reflecting surfaces, like mirrors, smooth surfaces and clear water.
- The angle of incidence is equal to angle of reflection.
- The incident ray, the reflected ray and the normal all lie in the same plane.

46.
- If two or more resistor are connected in such a way that the ends on one side of them are connected to one common point and the ends on the other side are connected to another common point, then the connection of such resistor is parallel.



- As shown in figure connect R_1, R_2 and R_3 resistor in parallel with combination of cells.
- The total current I, is equal to the sum of the separate currents through each branch, of the combination.
- $I = I_1 + I_2 + I_3$ ... ... (1)
- Let R_p be the equivalent resistance of the parallel combination of resistors. By applying Ohm's law to the parallel combination of resistors we have

$$I = \frac{V}{R_p} \quad \text{... ... (2)}$$

On applying Ohm's law to each resistors.

$$I_1 = \frac{V}{R_1}$$

$$I_2 = \frac{V}{R_2}$$

$$I_3 = \frac{V}{R_3} \quad \text{... ... (3)}$$

From equation no. (1) and (2)

$$\frac{V}{R_p} = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3} \text{ OR}$$

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \quad \text{... ... (4)}$$

- Thus, we can conclude that the reciprocal of the equivalent resistance of a group of resistance joined in parallel is equal to the sum of the reciprocals of the individual resistances.

Section-D

47. Preparation of plaster of Paris

- It is prepared from gypsum. Plaster of Paris is prepared by heating gypsum to a temperature of 373K. When gypsum is heated to a temperature of 373K, it loses three-fourths of its water of crystallization and forms Plaster of Paris.
- $CaSO_4 \cdot 2H_2O \xrightarrow{373\ K} CaSO_4 \cdot \frac{1}{2} H_2O + \frac{3}{2} H_2O$
- Gypsum Plaster of paris
- Plaster of Paris is a white powder and on mixing with water, it changes to gypsum once again giving a hard mass.
- $CaSO_4 \cdot \frac{1}{2} H_2O + 1\frac{1}{2} H_2O \rightarrow CaSO_4 \cdot 2H_2O$
- Plaster of paris water Gypsum

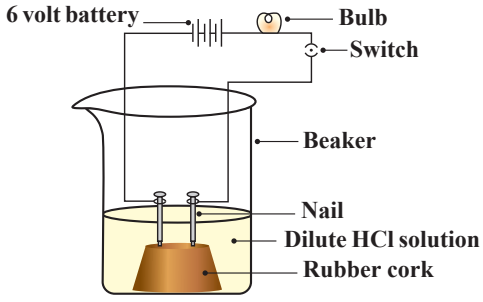
Uses :

- As a plaster to regenerate broken bones by physicians.

- To make toys and sculpture
- To make decorative materials.
- To smooth en the surface of the wall.

48. **Procedure**

- Take solutions of glucose, alcohol, hydrochloric acid, sulphuric acid, etc.
- Fix two nails on a cork, and place the cork in a 100 ml beaker.
- Connect the nails to the two terminals of a 6 volt battery through a bulb and a switch, as shown in Figure.
- Now pour some dilute HCl in the beaker and switch on the current.
- Repeat with dilute sulphuric acid.



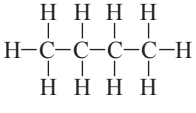
Observation

- The bulb will start glowing in the case of acids, as shown in Figure.
- But glocose and alcohol solutions do not conduct electricity.
- Glowing of the bulb indicates that there is a flow of electric current through the solution. The electric current is carried through the acidic solution by ions.

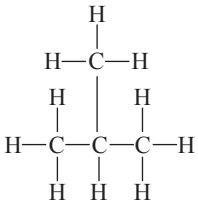
Conclusion

- Acids are substances that produce hydrogen ions as they dissociate with water.
- As some compounds dissociate in aqueous solution, hydrogen ions are produced, giving them an acidic character.
- The release of the H^+ ion in water determines if a compound is acidic or non-acidic.
- $HCl \rightarrow H^+ + Cl^-$
- $HNO_3 \rightarrow H^+ + NO_3^-$
- While compounds like glucose and alcohol contain hydrogen, they do not have an acidic nature.
- The hydrogen in them does not separate as easily as the hydrogen in acids.
- When they dissolve in water, they will not separate into hydrogen ions.

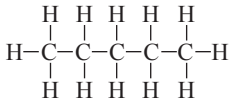
49. **An isomer is a molecule with the same molecular formula as another molecule, but with a different chemical structure.**



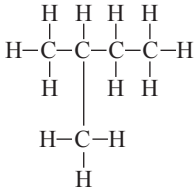
n-butane
or
butane



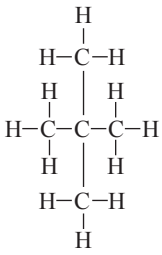
i-butane
or
isobutane



Common names :
n-pentane

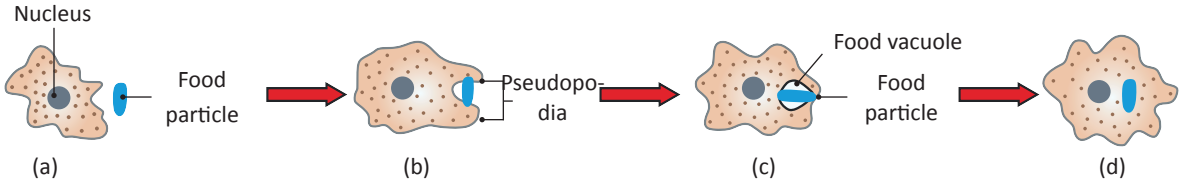


Isopentane



Neopentane

50. Amoeba :

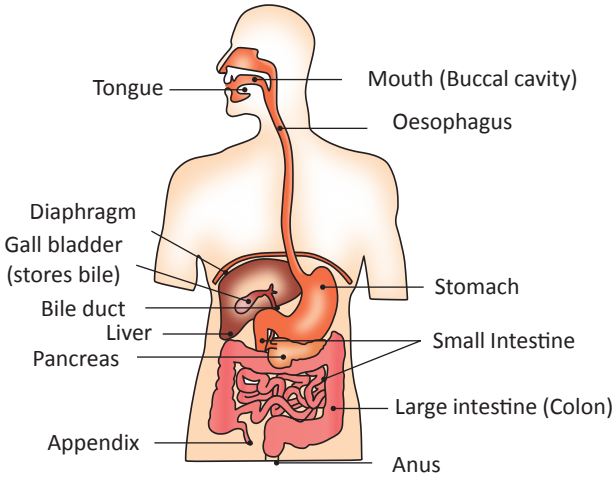


- **Nurition in Amoeba :**
- Amoeba is unicellular animal.
- The mode of nutrition in Amoeba is holozoic.
- In Amoeba the process of obtaining food is called phagocytosis (means cell feeding).
- The various processes involved in nutrition are ingestion, digestion, absorption, assimilation and egestion.
- **Ingestion :** Amoeba ingests food particles by forming temporary finger like projections known as pseudopodia around them so the food is en-captured along with lysosomes into a bag called food vacuole.
- **Digestion :** In Amoeba food is digested in the food vacuoles by digestive enzymes.
- **Absorption :** The digested food found in food vacuoles is absorbed directly into cytoplasm by diffusion.
- **Assimilation :** A part of the food absorbed in cell is used to obtain energy through respiration. The remaining part is used in the growth of Amoeba.
- **Egestion :** The undigested food remains in the food vacuole is thrown out of the body by rupturing cell membranes.

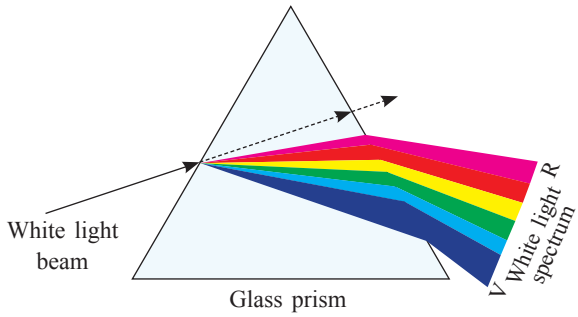
51. Saliva contains an enzyme called salivary emylase. If break down complex molecules of starch into sugar.

- In addition saliva makes food wet and fluffy so that food can be swallowed easily.

- Hydrochloric acid (HCl) in the stomach produces an acidic medium. Which helps in the process of enzyme pepsin.
- It also destroys the bacteria that enter in stomach with food.
- It dissolves insoluble salts.



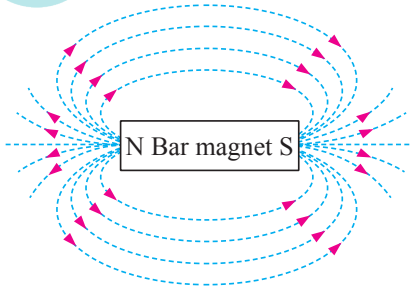
52. The phenomenon of splitting of white light into its seven constituent colors when it passes through a glass prism is called dispersion of white-light.



- **Procedure :**
- Take a thick sheet of cardboard and make a small hole or narrow slit in its middle.
- Allow sunlight to fall on the narrow slit. This gives a narrow beam of white-light.
- Now, take a glass prism and allow the light from the slit to fall on one of its faces as shown in figure.
- **Observation :**
- The prism splits the incident white light into a band of colours.
- The various colours seen are violet, indigo, blue, green, yellow, orange and red.
- The acronym VIBGYOR will help you to remember the sequence of colour.
- The band of the colored components of a light beam is called its spectrum.
- **Conclusion :**
- Different colours of light bend through different angles with respect to the incident ray, as they pass through a prism.
- The red-light bends the least, so it has more velocity.
- The violet-light bends the most, so it has least velocity.

53. The lines drawn around the magnetic field of any magnet are known as magnetic field lines which are also used to determine the direction of the magnetic field.

- **Properties of magnetic lines of force :**
- Outside the magnet the field lines originate from north pole and end at the south pole.
- The magnetic field lines are continuous closed loops.



- **Properties of magnetic lines of force :**
- Field lines arise from North Pole and end into South Pole of the magnet.
- Field lines form circular loop.
- Field lines are closer in stronger magnetic field.
- Field lines never intersect each other as for two lines to intersect; there must be two North directions at a point, which is not possible.
- As we go far from magnets, intensity of magnetic field lines gets decreased.

54. All the interacting organisms in an area together with the non-living constituents of the environment form an eco-system.

- Thus, an ecosystem consists of biotic components comprising living organisms and abiotic components comprising physical factors like temperature, rainfall, wind, soil and minerals.
- The series of organisms taking part at various biotic level form the food chain.
- Each level of the food chain forms a trophic level.
- The autotrophs or the producers are at the first trophic level. They fix up the solar energy and make it available for heterotrophs or the consumers.
- Herbivores or the primary consumers form the second level.
- Small carnivores or the secondary consumers at the third.
- Larger carnivores or the tertiary consumers form the fourth trophic level.

First Trophic Level	→	Second Trophic Level	→	Third Trophic Level	→	Tertiary Trophic Level
Autotrophs Or Producers		Herbivores or Primary Consumers		Small Carnivores Or Secondary Consumers		Large Carnivores Or Tertiary Consumers

- Different food chains are formed in nature. For example,
- Green plants in forest → Deer → Tiger
- Green plants in grass land → Grass hopper → Frog → Snake → Eagle.
- Green plants in lake → Scorpion → Fish → Duck.

- This is one of the ways in which they enter the food chain.