

Part - II

Explain complex concepts in simple terms. Section - I

Use real-life examples to illustrate principles. 2

Include diagrams and flowcharts to illustrate processes.

Discuss practical applications of scientific concepts.

Show all steps and working for calculations.

Use diagrams and graphs to illustrate concepts.

Ans(a): Lipids are organic substances that are fat soluble and water insoluble.

They are made of carbon, hydrogen, and oxygen.

They are essential for cell signaling and cell structuring. They help in storing energy and making hormones. They are also part of the cell membrane. Lipids are characterised into multiple types.

1. Types of Lipids:

(i) Fats: These lipids give human body the energy that it requires to function properly.

(ii) Waxes: These lipids are esters of fatty acids.

(iii) Phospholipids: These lipids are the key components of cell membrane.

(iv) Triglycerides: These lipids store and transport energy.

(v) Steroids: These lipids play an important role in cell signaling.

(vi) Complex Lipids: There are other complex lipids as well such as cholesterol.

2. Functions of Lipids:

- (i) Energy Storage: Lipids are the main long-term energy source of human body.
- (ii) Cell Membrane Formation: Lipids such as phospholipids form the structural framework of cells. They monitor and regulate movements of substances in and out of cells.
- (iii) Insulation: Lipids help in maintaining body temperature.
- (iv) Protection: Fat deposits provide cushioning to internal organs and safeguard them from physical injuries.
- (v) Chemical Signaling: Lipids like hormones regulate a number of biological processes including metabolism and growth.
- (vi) Vitamin Absorption: Lipids are crucial for absorption of fat-soluble vitamins such as Vitamin A and K.

b.

Ans: It is pertinent that humans conserve energy and shift to sustainable use because fossil fuel energy is non-renewable and not eco-friendly. Following are measures that can be adopted:

- (i) Public Transport: Cycling and mass use of public transport reduce greenhouse

emissions compared to mass use of cars.

(ii) Smart Technology: Companies like Xiaomi make smart home technology such as motion detection light switches. Such technology helps control energy use based on need and prevents wastage.

(iii) Recycling: Recycling used materials uses less energy than extracting raw material over and over and manufacturing new products.

(iv) Behavioural Adjustment: Practices such as making sure to switch off lights and unplug appliances when not in use can be quite beneficial.

(v) Tree Plantation: Trees regulate temperature and counter urban heat thus reducing dependence on air-conditioners during summer.

(vi) Solar Panels: Installing solar panels at home can help reduce dependency on grid power supply thus reduce need for non-renewable energy.

(vii) Home Insulation: Home insulation can help reduce use of heaters during colder months.

(viii) Awareness Campaigns: Local governments can carry awareness campaigns to educate people on energy conservation.

(ix) Sustainable Agriculture: Renewable-energy powered irrigation methods can help in saving

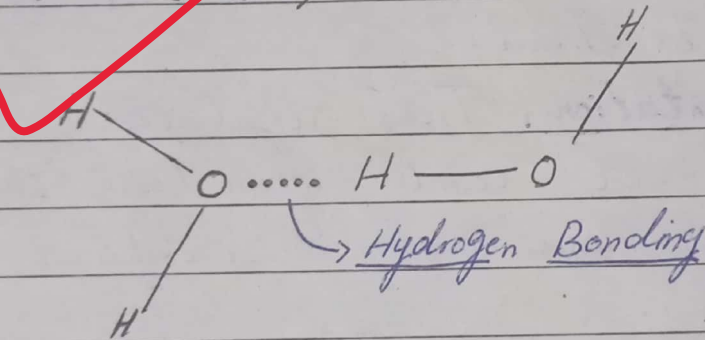
energy especially in agriculture dependent developing countries.

c.

Ans: Hydrogen bonding is a dipole-dipole attraction bonding. It is weak. It happens when a hydrogen atom covalently bonded to electronegative atom interacts with another electronegative atom.

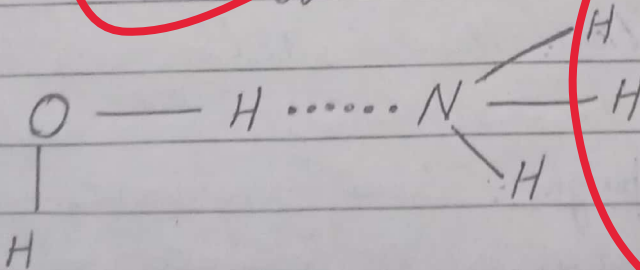
Structures as Examples:

i) Water (H_2O)



Each water molecule forms up to ~~two~~ four hydrogen bonds.

ii) Ammonia (NH_3)



Ammonia has electronegative atom nitrogen connected to hydrogen atoms.

d.

Ans: The nervous system is a complex system of nerves, neurons, and cells that transmit signals for purpose of sensory information and coordination of body's actions. It has two main parts, Central Nervous System and Peripheral Nervous System.

1. Central Nervous System: Central Nervous System is the control center of body. It has following components:

(i) Brain: It controls thoughts, emotions, and memory. It is divided into three parts. These three parts are cerebrum, cerebellum, and brainstem.

(ii) Spinal Cord: It connects brain to the rest of the body. It transmits signals to and from the brain.

Functions of Central Nervous System:

(i) It processes sensory information.

(ii) It helps in coordination of voluntary and involuntary actions.

(iii) It stores information and facilitates learning.

2. Peripheral Nervous System: It connects Central Nervous System to the rest of the body. It is further divided into:

(i) Somatic Nervous System: It controls voluntary movements.

(ii) Autonomic Nervous System: It regulates involuntary functions like heartbeat, digestion, and breathing. It is sub-divided into:

Sympathetic Nervous System: It activates "flight or fight" response during stress.

Parasympathetic Nervous System: It promotes "rest and digest" activities for relaxation and recovery.

Section - II

Q.No.6

a.

Sol:

Let, three-digit number be abc

a is hundreds

b is tens

c is ones

Then,

$$a + b + c = 15 \quad \text{--- (i)}$$

$$b + c = 12 \quad \text{--- (ii)}$$

$$b - c = 2 \quad \text{--- (iii)}$$

Adding (ii) and (iii)

$$b + b + c - c = 12 + 2$$

$$2b = 14$$

$$b = 7$$

Put $b = 7$ in (1)

$$b + c = 12$$

$$7 + c = 12$$

$$c = 5$$

Putting values of b & c in (1)

$$a + b + c = 15$$

$$a + 7 + 5 = 15$$

$$a = 15 - 12$$

$$a = 3$$

Three-digit number is 375.

b.

Sol:

$$\text{Small pizza} = 2x$$

$$\text{Medium pizza} = 3x$$

$$\text{Large pizza} = 4x$$

Then,

$$2x + 3x + 4x = 18$$

$$9x = 18$$

$$x = 2$$

$$\text{Small pizza} = 2(2) = 4$$

$$\text{Medium pizza} = 3(2) = 6$$

$$\text{Large pizza} = 4(2) = 8$$

Each slice is 40 gm then

Weight of:

$$\text{Small} = 4(40) = \boxed{160 \text{ gm}}$$

$$\text{Medium} = 6(40) = \boxed{240 \text{ gm}}$$

$$\text{Large} = 8(40) = \boxed{320 \text{ gm}}$$

Small pizza is 320 rs and has 4 slices then

$$\text{Price of one slice} = \frac{320 \text{ Rs}}{4}$$

$$= 80 \text{ Rs}$$

$$\text{Price of Medium Pizza} = 6 \times 80 \text{ Rs}$$

$$= \boxed{480 \text{ Rs}}$$

$$\text{Price of Large Pizza} = 8 \times 80 \text{ Rs}$$

$$= \boxed{640 \text{ Rs}}$$

c.

Sol:

$$\text{radius } (r) = \frac{\text{diameter}}{2}$$

$$r = \frac{6}{2}$$

$$r = 3 \text{ cm}$$

$$C = 2\pi r$$

$$= (2)(3.14)(3)$$

$$= (6)(3.14)$$

$$= \boxed{18.85 \text{ cm}}$$

$$\text{Area} = \pi r^2$$

$$A = (3.14)(3)^2$$

$$= (3.14)(9)$$

$$= 28.3 \text{ cm}^2$$

d.

Sol:

$$i. 13, 24, 46, 90, 178, 354$$

$$24 - 13 = 11$$

$$46 - 24 = 22$$

$$90 - 46 = 44$$

$$178 - 90 = 88$$

Next difference = 176

$$178$$

$$176$$

$$354 \rightarrow \text{Answer}$$

$$ii. 5, 6, 9, 14, 21, 30$$

$$6 - 5 = 1$$

$$9 - 6 = 3$$

$$14 - 9 = 5$$

$$21 - 14 = 7$$

Next term = 9

$$30 - 21 = 9$$

DATE: / /

90

Q. No. 7

a.

Ans: I.Q. is Intelligence Quotient.
E.Q. is Emotional Quotient.

b.

Sol:

Let present age of Aman be x

After 20 years,

$$x + 20$$

10 years before

$$x - 10$$

Then,

$$x + 20 = 10 \times (x - 10)$$

$$x + 20 = 10x - 100$$

$$10x - x = 100 + 20$$

$$9x = 120$$

$$x = 13.33$$

Aman's age 13 years and 4 months

c.

Sol:

Peter = $\frac{1}{40}$ lawn per minute

John = $\frac{1}{60}$ lawn per minute

$$\begin{aligned}
 \text{Combined rate} &= \frac{1}{40} + \frac{1}{60} \\
 &= \frac{3}{120} + \frac{2}{120} \\
 &= \frac{5}{120} \\
 &= \frac{1}{24}
 \end{aligned}$$

Together they will take 24 minutes

Sol.

Let original number be x then,

$$\text{Correct operation} = x \times \frac{5}{3}$$

$$= \frac{5x}{3}$$

$$\text{Wrong operation} = \frac{3x}{5}$$

$$\text{Error} = \frac{5x}{3} - \frac{3x}{5}$$

$$= \frac{25x}{15} - \frac{9x}{15}$$

$$= \frac{16x}{15}$$

$$\text{Percentage error} = \frac{\text{Error}}{\text{Correct result}} \times 100$$

$$= \left(\frac{16x}{15} \times \frac{3}{5x} \right) \times 100$$

DATE: ___/___/___

(12)

$$= \frac{48}{78} \times 100$$

$$= \frac{48}{3} \times 4$$

3

192

3

$$\boxed{= 64 \%}$$