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Q.No.2

what is un-balanced diet? How it affects the healthy living?

c)

Answer

An unbalanced diet is one that lacks the correct proportion of nutrients (carbohydrates, fats, proteins, vitamins,) and calories needed for the body to function properly.

⇒ An unbalanced diet affects healthy living by:

i) causing nutrient deficiencies or excesses; This can lead to various health problems like anemia, scurvy, or obesity.

ii)

weakening the immune system,

A lack of proper nutrition can make the body more susceptible to illnesses and infections.

iii)

Impairing growth and development especially in children, an unbalanced diet can hinder physical and cognitive development.

iv)

Increasing risk of chronic diseases long-term poor diet is a major risk factor for conditions such as type 2 diabetes, heart disease, stroke, and certain cancers.

v)

Reducing energy levels and overall well being. it can lead to fatigue, poor concentration, and a general feeling of being unwell.

D)

Describe the structure and functions of cell wall, cell membrane, cytoplasm

and mitochondria?

Answer

The cell wall (plants/fungi) provides rigid support and protection made of cellulose/chitin. The cell membrane (all cells) controls entry/exit via a lipid bilayer; cytoplasm is the jelly-like substance filling the cell where reactions occur, and mitochondria (eukaryotes) are the powerhouses generating ATP energy through cellular respiration, featuring inner folds (cristae) for increased surface area.

⇒ Plant cell structure.

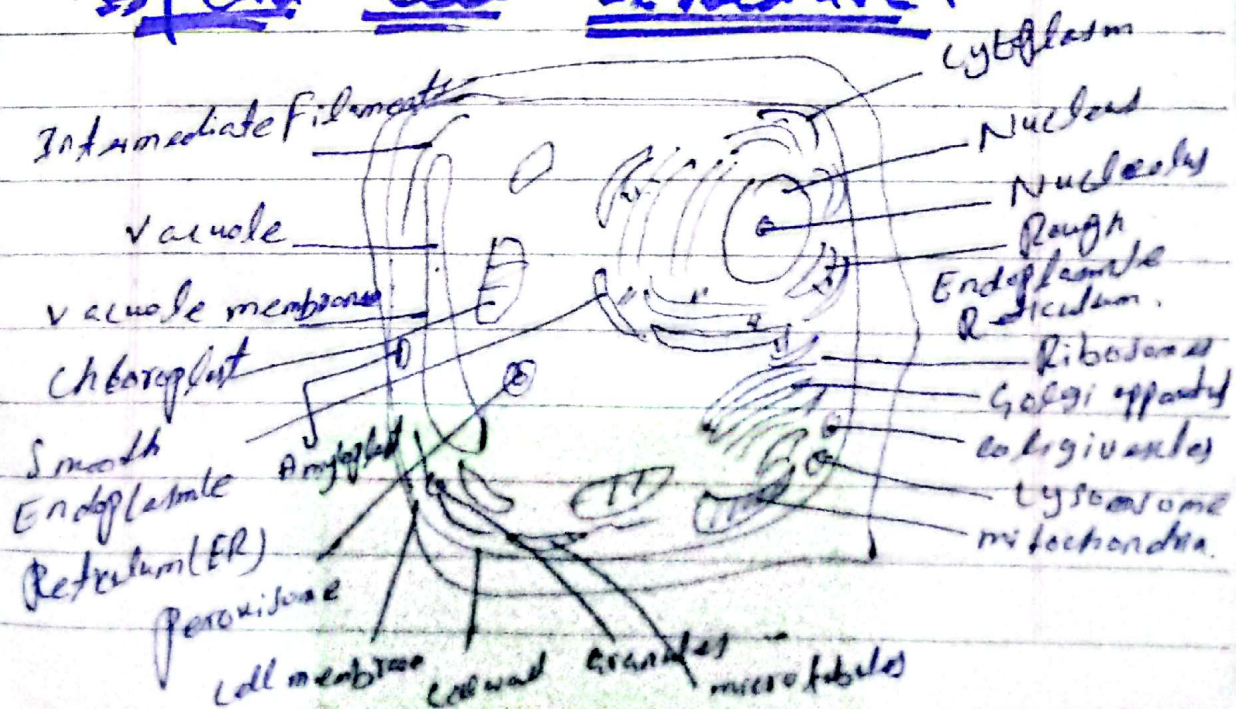


Diagram show the cell wall outside the membranes, with cytoplasm filling the interior, mitochondria.

1) Cell wall (Plants, Fungi, Bacteria).

Structure: A rigid outer layer, primarily cellulose in plants (with pectin, hemicellulose) and chitin in fungi, outside the cell membrane.

Function: Provides structural support, maintains cell shape, protects against osmotic lysis (bursting), and regulates molecule passage.

Cell membrane (Plasma, membrane)

Structure: A flexible, selectively permeable bilayer of phospholipids with embedded proteins (lipid bilayer).

Function

Regulates what enters and leaves the cell (transport).

receives signals, facilitates cell adhesion, and maintains cell integrity.

⇒ Cytoplasm.

Structure

The jelly-like substance (cytosol) filling the cell, surrounding organelles, composed of water, salts and organic molecules.

Functions

Site for many metabolic reactions (like glycolysis), supports organelles, and facilitates movement within the cell.

Mitochondria (sing. mitoch. mitochondrion)

⇒ Structure

Oval-shaped organelles with a double membrane! The inner membrane is folded into cristae, increasing surface area.
Function.

The "powerhouses" generating

most of cell's ATP (energy currency) through cellular respiration.

Q.No.3

a) How global warming can be reversed?

Answer

Global warming cannot be fully reversed, but its effects can be mitigated and future warming limited.

Global warming is the long term heating of Earth's climate system observed since the pre-industrial period due to human activities, primarily fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth's atmosphere. The accumulated greenhouse gases remain in the atmosphere for decades to centuries meaning that even if emissions stopped completely today, some warming would continue for a

period.

mitigation efforts focus on reducing net greenhouse gas emissions to zero (net zero) and enhancing natural carbon sinks. These strategies include:

i) **Transitioning to renewable energy sources** like solar, wind, and hydro power to replace fossil fuels.

ii) **Improving energy efficiency** in transportation, industry, and buildings.

iii) **Implementing carbon capture and storage (CCS)** technologies to remove CO_2 from the atmosphere or from industrial sources.

iv) **Protecting and restoring natural ecosystems**. Such as forests and wetlands, which absorb CO_2 .

The goal of international agreements like the Paris Agreement is to limit the temperature increase to 1.5°C or 2°C above pre-industrial levels, which requires rapid and far-reaching transitions in all aspects of society.

→ b) Define Ceramics. Give properties and applications of Ceramics.

→ Answer

Ceramics are inorganic, non-metallic solids made by heating raw materials to high temperatures.

→ Properties of Ceramics.

- i) Typically hard, strong in compression and brittle in tension.
- ii) Possess high melting points and are good thermal insulators.
- Exhibit excellent electrical

resistance and often used as insulators.

A

highly resistant to chemical corrosion and degrading.

Applications of Ceramics

- i) Construction, Bricks, tiles, and Cement for building
- ii) Electronics.
thermal insulators, capacitors, and substrates for circuits.
- iii) Biomedical Dental implants, bone replacements, and surgical tools.
- iv) Aerospace, Heat shields and components in high-temperature environments.

Q.No. 4

A) Explain the role of heart and blood vessels in circulation:

Answer

The heart and blood vessels work together to circulate blood throughout the body.

How:

= Heart

The heart is a pump that pushes blood through the circulatory system. It has four chambers.

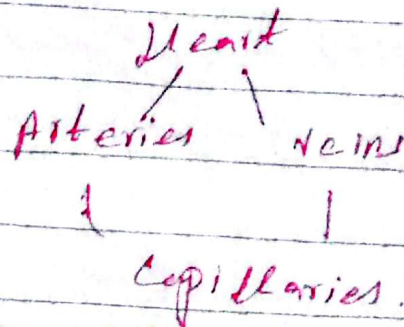
- i) Right atrium, receives oxygen-depleted blood.
- ii) Right ventricle, pumps blood to lungs.
- iii) Left atrium, receives oxygen-rich blood from lungs.
- iv) Left ventricle, pumps oxygen-rich blood to body.

=> Blood vessels.

- i) Arteries: carry oxygen-rich blood away from the heart to the body
- ii) Veins: carry oxygen-depleted blood back to the heart.

capillaries : tiny vessels where oxygen and nutrients are exchanged with tissues.

diagram



The Circulation process:

1)

oxygen-depleted blood returns to the heart (right atrium) via veins.

ii) Blood flows to right ventricle, then to lungs to pick up oxygen.

3) oxygen-rich blood returns to heart (left atrium), then to left ventricle.

4) Left ventricle pumps blood to the body via arteries.

5) oxygen and nutrients are exchanged in capillaries.

6) oxygen-depleted blood returns to heart.

- b) what is the cyclone?
Describe the formation of
cyclone?
= Answer

Cyclone: Powerful storm that can bring heavy rains and strong winds.

A cyclone is a large-scale air mass that rotates around a low pressure center.



Here's how they form,

Formation of a cyclone:

- i) Warm ocean waters:

Cyclone form over warm ocean waters (at least 26.5°C or 80°F) with high humidity.

- ii) Moisture and heat

As the sea surface evaporates, moist air rises, creating an area of low pressure.

- iii) Rotation:

Air from surrounding areas moves, is rotating due to

Coriolis force (deflected to right in the northern).

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Eye formation: The rotating air creates a central eye with calm weather and low pressure.

5) **Intensification:** The cyclone strengthens as it absorbs more moisture and heat, increasing wind speeds.

moist air rises $\Rightarrow$ clouds and thunderstorms
low pressure (eye) $\leftarrow$

Cyclone Structure

- i) Eye: calm center with low pressure,
- ii) Eye wall: surrounding ring of intense thunderstorms.
- iii) Rainbelt Rainbands: outer bands of rain and thunderstorms.

Ques what is DRM? Give the importance of Risk

answer in DRM:

Answer

DRM:

Disaster Risk management is a process to identify, assess and reduce risk to minimize the impact of disasters (natural or man-made). It involves strategies to prevent, prepare for, respond to, and recover from disaster.

= importance

Risk assessment is a crucial step in DRM. It helps:

i) Identify potential hazards and vulnerabilities.

ii) Analyze likelihood and impact of disasters.

iii,

Prioritize risks and allocated resources.

iv Develop effective mitigation and

preparedness plans.

Risk Assessment Steps:

- 1) Identify hazards (floods, earthquake, etc).
- 2) Analyze vulnerability and exposure.
- 3) Evaluate risk (Likelihood & Impact)
- 4) Prioritize risk.

By assessment risks, communities and organizations can take proactive measures to reduce disaster impacts, save lives, and protect assets.

b).

Define biofuels? Explain the production of biofuels and bio gas.

Answer

Biofuels: A renewable energy source.

Biofuels use feed produced from organic matter (biomass) like

Plants, algae, or waste, common type include ethanol, biodiesel, and biogas.

Production of Biofuels:

=>

Ethanol Production:

- Ferment sugars from crops (Sugarcane, corn) using yeast.
- Distill and purify ethanol for use in vehicles.

=> Biodiesel Production:

Extract oils from plants (Soybean, Palm), or waste oils.

- Process oils into biodiesel through transesterification.

=> Biogas production:

- Anaerobic digestion of organic waste (Food waste, manure).
- produces methane-rich biogas for energy.

Gas production (Biogas):

Biogas is produced through

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anaerobic digestion of biomass.

organic waste microorganisms.

break down waste methane (CH_4) & CO_2 .

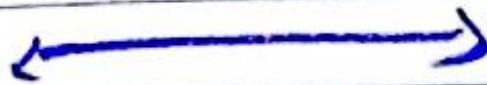
Bio gas can be used for cooking heating or electricity.

= Benefits

i) Renewable and sustainable.

ii) Can reduce greenhouse gas emissions.

iii) Utilize waste materials.



Math Section.

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(1)

MON TUE WED THU FRI SAT

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a.) The woman's granddaughter is the daughter of Ahson's brother, i. Ahson's niece.
Thus the woman is Ahson's **Mother.**

B). Let Length = $3x$

$$\text{breadth} = 2x$$

$$\text{Perimeter} = 2(3x + 2x) = 10x$$

$$\text{Speed} = 12 \text{ km/hr} = \frac{12 \times 1000}{60} = 200 \text{ m/s}$$

$$\text{Distance in 8 min} = 6$$

$$200 \times 8 = 1600 \text{ m}$$

$$10x = 1600 \Rightarrow x = 160$$

$$\text{Area} = \text{length} \times \text{breadth} =$$

$$\Rightarrow 3x \cdot 2x = 6x^2$$

$$\text{Area} = 6 \times 160^2 = 153600 \text{ m}^2$$

($\leftarrow$)

c) Let the number be $10a + b$

$$1. \quad b = a + b$$

$$2. \quad (10a + b)(a + b) = 144$$

$\Rightarrow b = a + 2$ into the second equation.

$$(10a + a + 2)(a + a + 2) = 144$$

$$(11a + 2)(2a + 2) = 144$$

$$22a^2 + 22a + 4a + 4 = 144$$

$$22a^2 + 26a - 140 = 0$$

$$a = 2$$

$$\text{Then } b = a + 2 = 4$$

$$\text{Number} = \log a + b = 24 \quad \underline{\text{Ans}}$$

←→

D) Let the number be $2k$ and $3k$,

$$\text{LCM}(2k, 3k) = 6k$$

$$= \text{Given LCM} = 48$$

$$6k = 48 = k = 8$$

Number are 16 and 24.

$$\text{Sum} = 16 + 24 = 40 \text{ Ans.}$$

←→

⇒ Question no 7

a) Let be, x

Let be, y

$$\text{Key of } x = \frac{2}{3}y$$

$$0.4x = \frac{2}{3}y$$

$$\text{Solve } \frac{x}{y} \Rightarrow x = \frac{2}{3} \cdot \frac{1}{0.4} y$$

$$= \frac{2}{3} \times \frac{10}{4} y$$

$$\Rightarrow \frac{5}{3} y$$

$$\text{Then, } \frac{x}{y} = \frac{5}{3} \text{ Ans.}$$

←→

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b) Time to type 116 pages,
Roshal type 32 pg in 6 hours,
rate =

$$\frac{32}{6} = \frac{16}{3} \text{ pages/hour}$$

Comran: type 40 page, in 5 hours.

$$\frac{40}{5} = 8 \text{ page/hours.}$$

=> Together on two computers. Their combined rate is.

$$\frac{16}{3} + 8 = \frac{16}{3} + \frac{24}{3} = \frac{40}{3}$$

$$= \frac{116}{\frac{40}{3}} = 116 \times \frac{3}{40} = \frac{320}{40} = 8.25 \text{ hrs}$$

c) Present age of son:

Let : Son's age = x

man = 24 years

manager = $x + 24$

$$\text{In 2 years: } \Rightarrow x + 24 + 2 = 2(x + 2)$$

$$x + 26 = 2x + 4$$

$$x, \Rightarrow 26 - 4 = 2x - x$$

$$x = 22 \text{ Any.}$$

b) Selling price of 17 balls:

cost price, 17 bal.

$$720 = 17L - 5L$$

$$720 = 12L$$