

PART-II

(SECTION-A)

(a)

GLOBAL WARMING:

Global warming refers to the long-term rise in Earth's average temperature due to excessive greenhouse gas (GHG) emissions. Though difficult, it can be reversed gradually through mitigation, adaptation, and restoration strategies.

Measures to Reverse Global Warming:-

- L> REDUCTION OF GHG EMISSIONS
- L> CARBON SEQUESTRATION
- L> SUSTAINABLE AGRICULTURE
- L> POLICY AND GLOBAL COOPERATION

1. Reduction of Greenhouse Gas Emissions:

- Shift from fossil fuels to renewable energy (Solar, wind, hydro).
- Improve energy efficiency in industries and buildings.
- Promote electric vehicles and public transport.

2. Carbon Sequestration:

- Afforestation and reforestation to absorb CO_2 .
- protection of forests, wetlands, and mangroves.
- Use of Carbon Capture and Storage (CCS) technology.

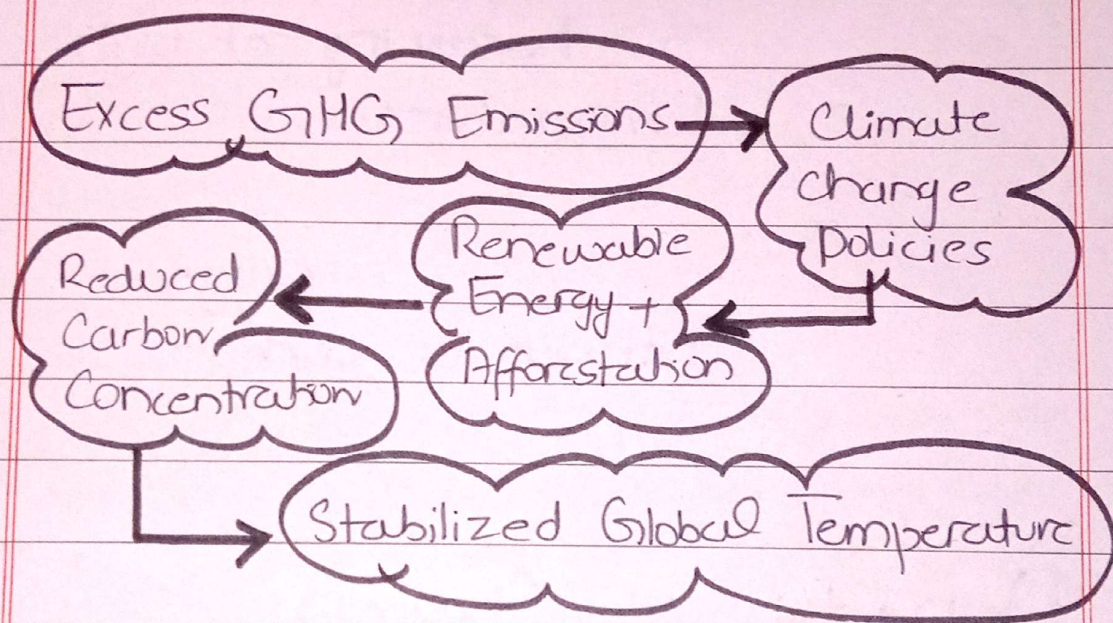
3. Sustainable Agriculture:

- Climate-smart farming practices.
- Reduced use of chemical fertilizers.

- Promotion of organic and regenerative agriculture.

4. Policy and Global Cooperation:

- Implementation of **Paris Climate Agreement** targets.
- Carbon pricing and environmental regulations.
- Climate finance for developing countries.



CONCLUSION:

Although complete reversal is **challenging**, consistent global action, carbon

reduction and ecological restoration can significantly slow down and gradually reverse global warming.

(b)

CERAMICS :-

Definition: Ceramics are in-organic, non-metallic materials made by shaping and then hardening at high temperatures, usually consisting of compounds of metal with oxygen, nitrogen, or carbon (oxides, carbides, nitrides)

Properties of Ceramics:

- ↳ Mechanical Properties
- ↳ Thermal "
- ↳ Electrical "
- ↳ Chemical ,

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1. Mechanical properties:

- Very hard and wear-resistant
- High Compressive strength
- Brittle in nature (low tensile strength)

2. Thermal properties:

- High melting point
- Excellent heat resistance
- Low Thermal conductivity (good thermal insulators)

3. Electrical Properties:

- Good electrical insulators
- Some ceramics show piezoelectric and superconducting behavior.

4. Chemical properties:

- Highly corrosion-resistant
- Chemically inert in harsh environments

Application of Ceramics:

1. Structural Applications:

- Bricks, tiles, cement, and pottery
- Refractory linings in furnaces and kilns

2. Electrical and Electronic Applications:

- Insulator in power transmission
- Capacitors, sensors, and semiconductors

3. Medical Applications:

- Dental implants and bone replacements
- Bio-ceramics for prosthetics

4. Advanced and Industrial Uses:

- Cutting tools and abrasives
- Heat shields in aerospace industry

CONCLUSION:

Due to their hardness, thermal stability, and chemical resistance, ceramics play a vital role in **construction, electronics, medicine, and advanced engineering.**

(c)

Working of Optical Fiber :-

1. Definition:

An optical fiber is a **thin, flexible glass** or plastic cable used to transmit data in the form of **light signals.**

2. Working:

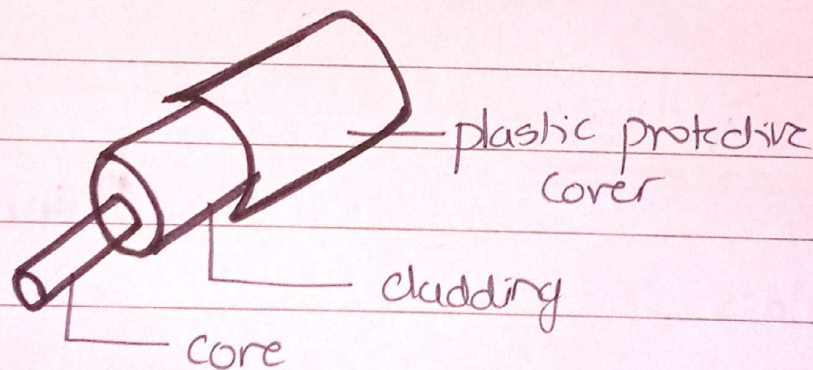
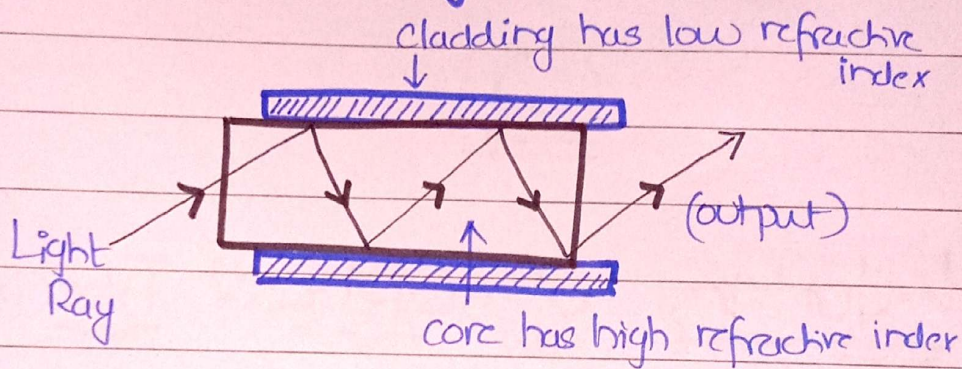
2.1 Principle:

Optical fiber works on the principle of **Total Internal Reflection (TIR)** of light.

2.2 Construction:

An optical fiber consists of:

- **Core** (high refractive index)
- **Cladding** (low refractive index)
- **protective coating**



2.3 Working:

- Electrical signals are converted into **light pulses** by a laser or LED.
- Light travels through the core by

repeated total internal reflection.

- At the receiving end, light signals are converted back into electrical signals.

2. Working of a Mobile Phone:

2.1 Principle: A mobile phone works on wireless communication using electromagnetic (radio) waves.

2.2 Working:

↳ The microphone converts sound waves into electrical signals.

↳ Signals are digitized and transmitted as radiowaves to the nearest cell tower.

↳ Cell towers route the signal through the network to the receiver.

↳ The receiver's speakers convert electrical signals back into

Sound.



CONCLUSION:

Optical fibers enable high-speed, low-loss data transmission, while mobile phones allow instant **wireless communication**, forming the backbone of modern telecommunication systems.

(d)

1. Food Additives:

Food additives are substances intentionally added to improve its taste, color, texture, or shelf life.

Examples:

- Monosodium glutamate (MSG) - flavor enhancer
- Food colors (tartrazine)
- Emulsifiers (lecithin)

2. Food Preservatives:

Definition:

Food preservatives are chemical or natural substances added to prevent spoilage caused by microorganisms.

Examples:

- Sodium benzoate in juices
- Potassium sorbate in cheese
- Salt and sugar (natural preservatives)

3. Food Adulteration:

Food Adulteration is the intentional mixing of inferior or harmful substances with food to increase profit.

Examples:

- Water added to milk
- Brick powder in chili powder
- Urea in milk

4. Food Contamination:

Food contamination is the unintentional presence of harmful substances (biological, chemical, or physical) in food.

Examples:

- Bacteria (Salmonella) in meat
- Pesticide residues on vegetables

- Dust or metal particles in food.

CONCLUSION:

While additives and preservatives are used for food quality and safety, adulteration and contamination pose serious risks to public health.

QUESTION NO:-5

(a)

Disaster Risk Management (DRM)

Disaster Risk Management refers to the systemic process of identifying, analyzing, reducing, and managing disaster risks to minimize loss of life, property, and livelihoods caused by

natural or man-induced hazards.
It includes prevention, mitigation,
preparedness, response, and recovery.

Importance of Risk Assessment in DRM :

Risk assessment is the backbone of effective DRM as it identifies who and what is at risk and why.

1. Identification of Hazards:

- Helps identify potential hazards (earthquakes, floods, droughts)
- Enables authorities to anticipate disasters in advance.

2. Vulnerability Analysis:

- Assesses exposed populations, infrastructure and weak sectors.
- Highlights high-risk areas and communities.

3. Efficient Resource Allocation:

- Ensures proper use of limited resources.
- Prioritizes high-risk zones for mitigation and preparedness.

4. Disaster Preparedness and Planning:

- Aids in early warning systems and evacuation planning.
- Improves emergency response capacity.

5. Reduction of Losses:

- Minimizes human, economic, and environmental losses.
- Strengthens resilience and sustainable development.

CONCLUSION:

Effective risk assessment enhances Disaster Risk Management by enabling informed decision making, preparedness,

and resilience against disasters.

(b)

Definition of Biofuels:

Biofuels are renewable fuels produced from biological materials (biomass) such as plants, animal waste, and organic residues, used as alternatives to fossil fuels.

Production of Biodiesel:

Raw Materials:

- Vegetable oils (Soybean, palm, jatropha)
- Animal fats
- Used cooking oil

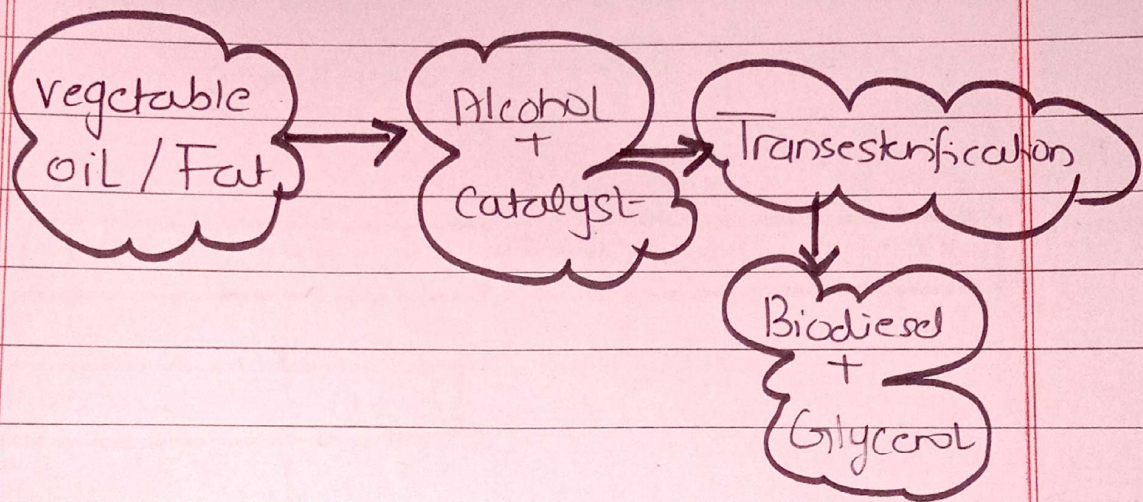
Process (Transesterification) :

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- oil or fats reacts with **alcohol** (methanol/ethanol) in the presence of a **catalyst** (NaOH/KOH). This reaction converts **triglycerides** into **biodiesel** (fatty acid methyl esters) and glycerol as a by-product.



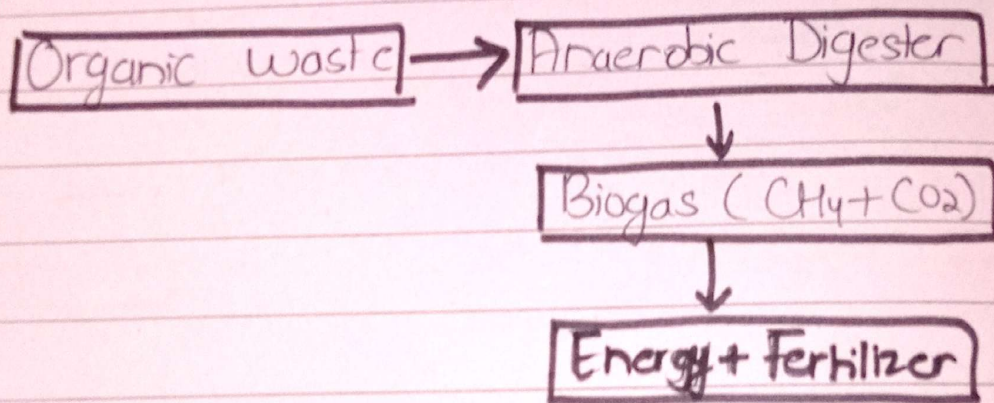
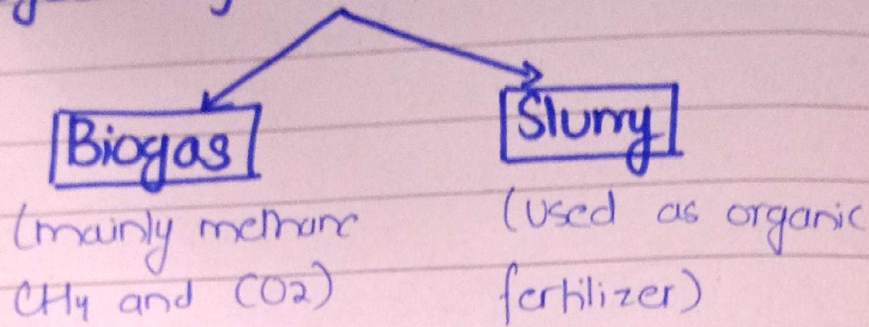
Production of Biogas :

Raw Materials:

- Animal dung
- Agricultural waste
- Food and sewage waste

Process (Anaerobic Digestion):

Organic matter is decomposed by anaerobic bacteria in the absence of oxygen. The process occurs in a biogas digester producing:



CONCLUSION:

Biofuels like biodiesel and biogas provide clean, renewable, and sustainable energy, reducing dependence on fossil fuels.

(c)

Digestive System:

The digestive system is a group of organs that **ingest food**. break it down into simple nutrients, absorb them into blood, and eliminate waste from the body.

It includes: mouth, oesophagus, stomach, small intestine, large intestine, liver, pancreas, and salivary glands which work together to promote digestion.

ROLE OF STOMACH:

The Stomach performs several important functions:

1. Temporary Storage:

Holds food after its swallowed, allowing **slow release** into small intestine.

2. Mechanical Digestion:

Churns food through muscular contractions to mix it with **gastric juices**, forming a semi-liquid substance called **chyme**.

3. Chemical Digestion:

Secretes gastric juice containing **hydrochloric acid (HCl)** and **pepsin enzyme**. HCl kills harmful microbes and provides an acidic environment for **protein digestion**. Pepsin breaks proteins into smaller peptides.

4. Protection:

Acidic environment destroys **bacteria** and pathogens ingested with food.

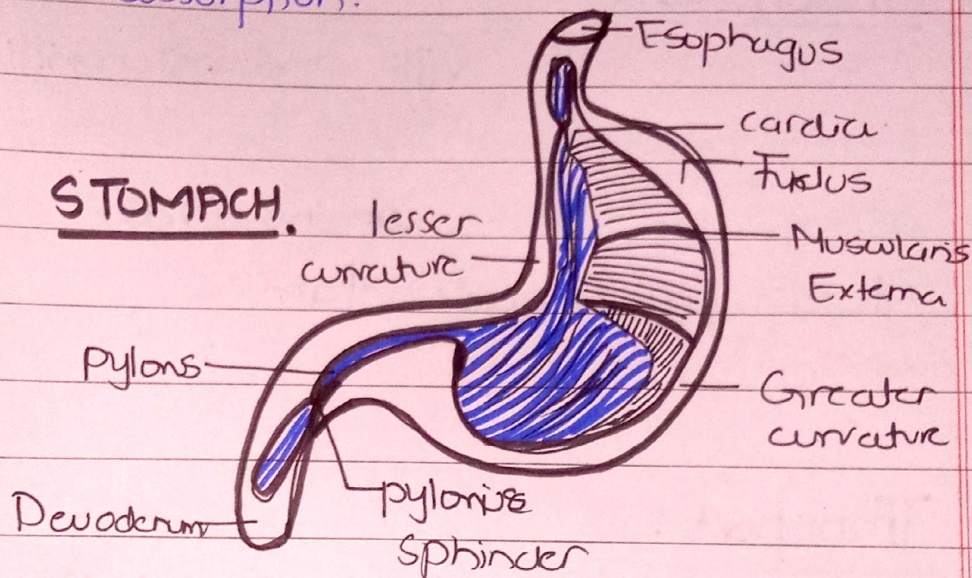
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5. Regulation:

Gradually releases chyme into the small intestine for further digestion and absorption.



ROLE OF SMALL INTESTINE:

The small intestine is the main site for digestion and absorption, performing the following roles:

1. Chemical Digestion:

Receives bile from liver (emulsifies fats)

and pancreatic enzymes. It also completes digestion of carbohydrates, proteins, and fats into simpler molecules.

2. Absorption:

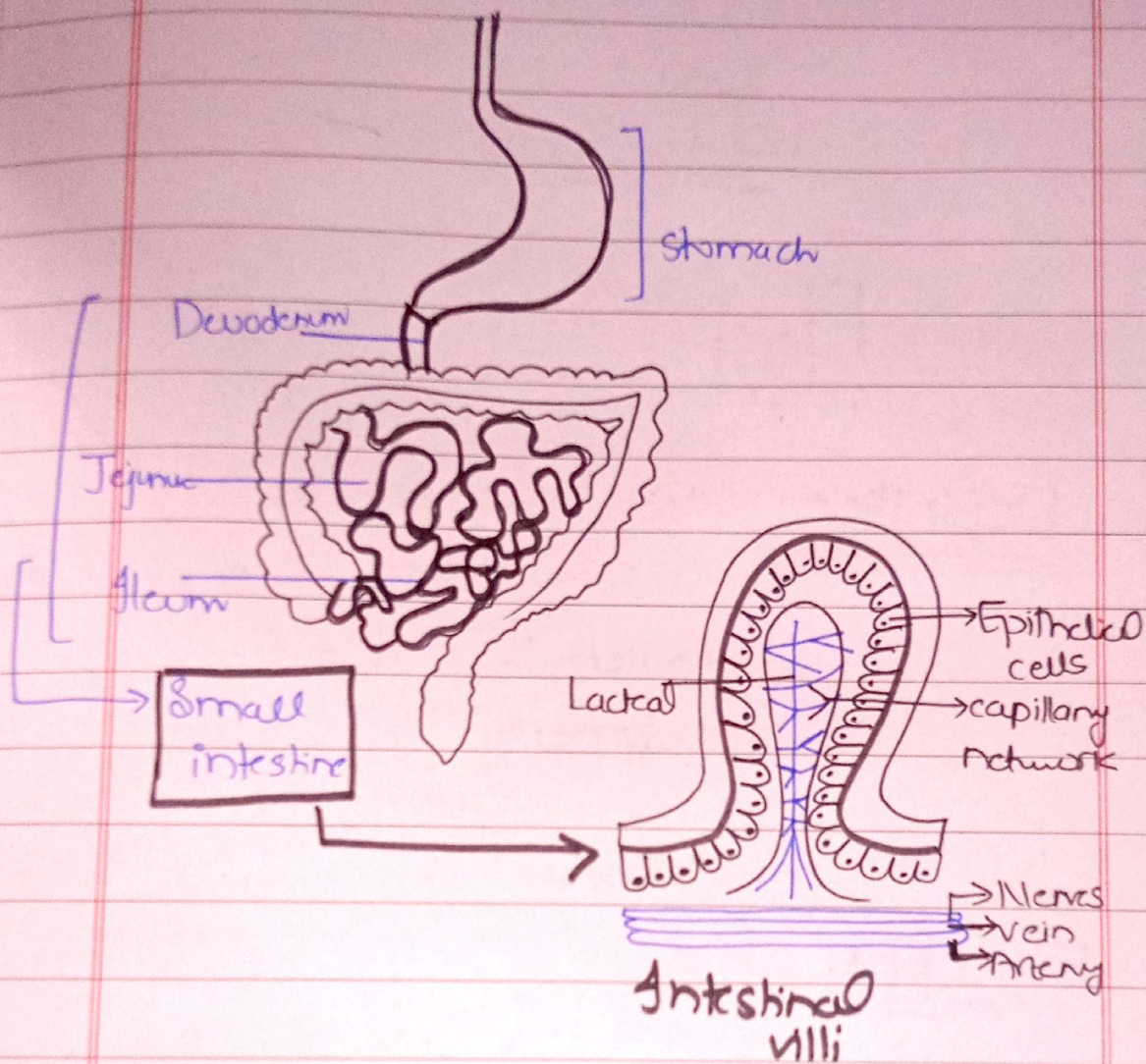
Its lined with villi and microvilli, increasing surface area for nutrient absorption. Absorbs amino acids, glucose, fatty acids, vitamins and minerals into blood and lymph.

3. Transport:

Moves chyme along by peristaltic movements to the large intestine.

4. Protection and Immunity:

Contains lymphoid tissue (Peyer's patches) to detect and fight pathogens.



CONCLUSION:

The Stomach initiates digestion by breaking down food mechanically and chemically, while the small intestine completes digestion, absorbs nutrients, and protects the body, making both organs vital for efficient digestion and nutrition.

(d)

Plastics

1. Definition: Plastics are synthetic or semi-synthetic organic materials made from polymers that can be moulded into various shapes when heated.

Examples:

Polyethylene (PE), Polyvinyl chloride (PVC), Polystyrene (PS), polypropylene (PP)

2. Properties of Plastics:

1. Lightweight: Easy to transport and handle.
2. Durable: Resistant to corrosion,

②

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chemicals, and water

3. Malleable and Flexible:

Can be molded into various shapes.

4. Insulating:

Poor conductors of heat and electricity.

5. Non-biodegradable:

Resistant to natural decomposition (also an environmental concern)

6. Transparent or Opaque:

Depending on type (e.g.: PET is transparent)

3. Application of Plastics:

1. Packaging: Bottles, wrappers, containers

2. Construction: pipes, insulation materials, windows, doors

3. Electronics and Electrical: Casings, insulation, gadgets

4. Healthcare: Syringes, prosthetics, medical devices

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5. **Automobile and Aerospace:** Interior parts, fuel tanks, lightweight components.

4. Environmental Risks of Plastics:

1. **Non-biodegradability:**

Accumulates in landfills and oceans.

2. **Marine pollution:**

Harmful to marine animals through ingestion or entanglement.

3. **Toxic chemicals:**

Release of harmful substances (like BPA) into soil and water.

4. **Greenhouse Gas Emissions:**

Burning plastics emit CO₂ and other toxins.

5. **Microplastics:**

Tiny particles enter food chains, affecting humans and wildlife.

CONCLUSION:

Plastics are versatile and widely used, but their environmental hazards require proper recycling, reduction, and alternative materials to ensure sustainable use.

SECTION - B

QUESTION NO:- 7

(a)

Soln:

40% of first number = $\frac{2}{3}$ of second number

Let >

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First number = x

Second number = y

So,

$$\frac{2}{5} \frac{4x}{10x} = \frac{2}{3} y$$

$$\frac{2x}{5} = \frac{2}{3} y$$

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

So,

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

Thus,

Ratio of first number to
Second number is 5:3

(B)

Given:

Selling price of 17 balls = Rs. 720

Loss = Cost price of 5 balls

To find:

Cost price (CP) of one ball = ?

Let the CP of one ball is $= x$

- CP of 17 balls = $17x$
- Loss = CP of 5 balls = $5x$

$$\text{Loss} = \text{CP} - \text{SP}$$

$$5x = 17x - 720$$

$$720 = 17x - 5x$$

$$720 = 12x$$

$$x = \frac{720}{12}$$

$$x = 60$$

So,

Cost price of one ball = Rs 60

(C)

Day: _____

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$$\text{Father's age} = \text{Son's age} + 24$$

$$\text{In 2 years: Father's age} = 2 \times \text{son's age}$$

Let,

$$\text{present age of Son} = x \text{ years}$$

$$\text{present age of father} = x + 24 \text{ years}$$

In 2 years:

$$\text{Father's age} = x + 24 + 2 = x + 26$$

$$\text{Son's age} = x + 2$$

So,

$$x + 26 = 2(x + 2)$$

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

$$26 - 4 = 2x - x$$

$$x = 22$$

$$\text{Present age of Son} = \boxed{22 \text{ years}}$$

$$\text{Father's age} = 22 + 24 = \boxed{46 \text{ years}}$$

(D)

Given,

Rashid: 32 pages in 6 hours,

$$\text{Speed} = \frac{32 \text{ pages}}{6 \text{ hours}}$$

$$\text{Kamran: speed} = \frac{40 \text{ pages}}{5 \text{ hour}}$$

Total assignment = 110 pages, both work together on 2 computers,

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

$$\text{Kamran} = \frac{40}{5} = 8 \text{ pages hour}$$

by combining both;

$$\begin{aligned} \text{Rashid} + \text{Kamran} &= 5.33 + 8 \\ &= 13.33 \text{ pages/hour} \end{aligned}$$

Time to complete 110 pages

$$\text{Time} = \frac{\text{Total pages}}{\text{combined speed}}$$

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$$= \frac{110}{13.33}$$

$$= 8.25 \text{ hours}$$

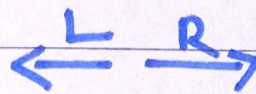
$$= 8 \text{ hrs and } 15 \text{ minutes}$$

Time taken together =

8 hours
15 minutes

QUESTION NO:-8

(A)



Given,

- A is to the right of B : $B \rightarrow A$
- E is to the left of C
and right of A : $A \rightarrow E \rightarrow C$
- B is to the right of D : $D \rightarrow B$

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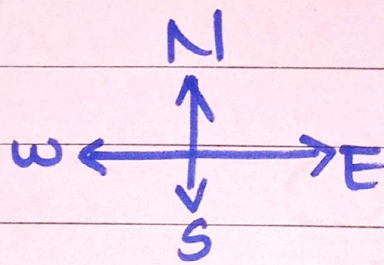
By combining the clues:

D ... B ... A ... E ... C

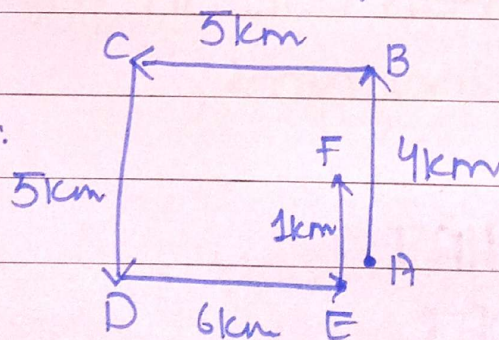
So,

The house in the middle is
"A"

part (B)



Let's make a diagram from information given in the question:



1. How many km are you from the place you started:

4.47km

2. In which direction will you be running while finishing?

EAST

3. After taking second turn in which direction will you be running?

SOUTH

4. Direction to reach start from finishing point?

NORTH EAST

(C)

Find odd man out in the following anagrams:

(a) THRSI = SHIRT

(b) AOTC = COAT

(c) EOUBSL = BLOUSE

(d) KTRIS = SKIRT

(e) RETFEWS = SWEATER

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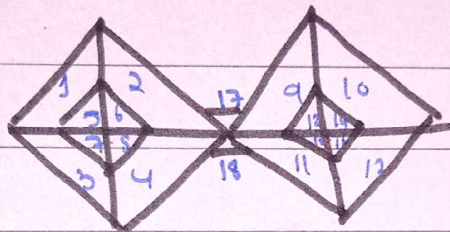
Date: _____

To identify the odd one:

- All except Skirt are upper body clothing

odd man out = SKIRT (KTRIS)

(D)



I can find 18 Triangles in the picture.

