

GSA

Question 1:

(a) Difference between food adulteration and contamination:

Food adulteration:

“Food adulteration is the physical, chemical or biological degradation of food which is intentional and for economic purposes.”

Intentional: It is done intentionally.

Purpose: Economic gains is the purpose of food adulteration.

Examples:

Mixing water in milk is an example of food adulteration.

Food contamination:

“It is the unintentional biological, physical or chemical degradation of food and it cannot be traced back to any individuals.”

Unintentional: It is unintentional.

Causes: Contamination by microscopic organisms which cannot be seen with the naked eye and contamination of ground water by leachate from landfills are some of the causes.

Examples: Food contamination by bacteria like salmonella or by hair and excreta of rodents are the examples.

Controlling measures of food adulteration:

- i. Regular monitoring and regulation by gov't bodies can keep perpetrators from adulterating food.
- ii. Imposing heavy fines can cause deterrence.
- iii. Pressure to provide quality food can help maintain the standard of food.
- iv. Creating awareness among the masses regarding these practices may prove to be a helpful and effective tool.

(b) Food preservation methods // with examples:

i. **Heating:** Heating food to a certain temperature for a certain time preserves food.

Example: Heating to 121°C for 15 minutes kills all the harmful bacteria including spores.

ii. **Freezing:** Freezing restricts the movement of microorganisms present in food and thus inactivates them.

Example: Freezing at 0°C or below preserves food. Rapid freezing is recommended.

iii. **Adding acids:** Acids produced by some microbes inactivate other microbes or they can be added separately.

Example: Citric acid added to soft drink preserves them.

iv. **Smoke:** It is one of the traditional methods used for preservation.

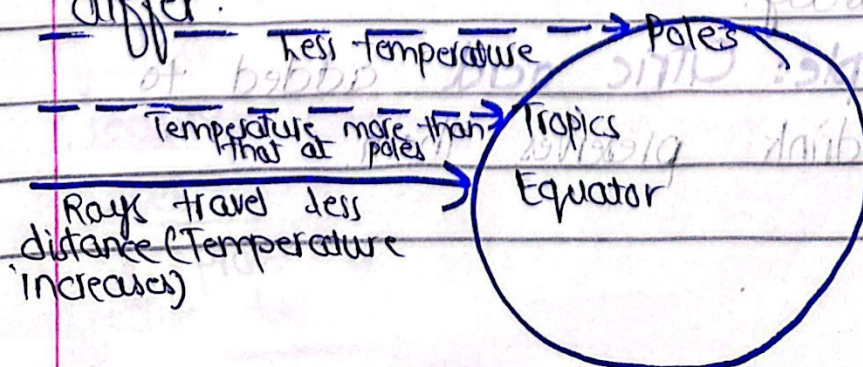
Example: Formaldehyde produced in smoke preserves them.

v. **Chemical preservatives:** These are specifically designed for preservation.

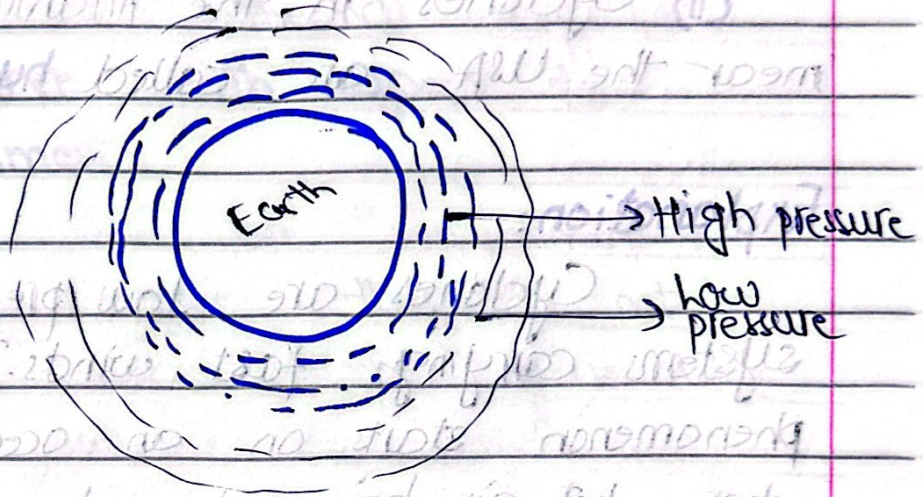
Example: Sodium benzoate acts as a preservative.

(c) **Explanation of weather variables:**

(i) **Temperature:** Radiation from the sun heats the atmosphere of the Earth. Inclination of Earth at a certain angle causes sunlight to reach different areas on Earth differently and as a result temperature at different latitudes differ.



(ii) **Pressure:** In Earth's atmosphere, certain gases are suspended like a blanket. Their pressure differs. Closer to Earth, where cool air sinks, pressure is more. Farther away from surface, less dense air causes pressure to decrease.



(iii) **Humidity:** Humidity is the presence of water vapours in a certain region in Earth's atmosphere. It differs from region to region. e.g. Rain forests are more humid than deserts. Deserts are mostly dry.

Types of humidity:

- (1) Absolute humidity
- (2) Relative humidity

(d) **Cyclones:** Cyclones are a disastrous natural phenomenon formed by low pressure systems with accompanying winds.

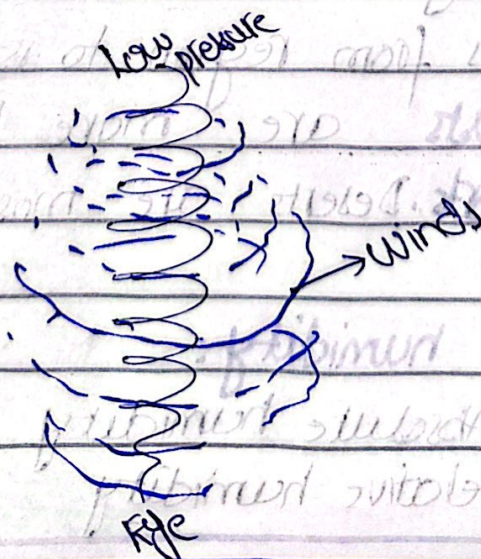
Examples:

(i) Cyclones in the North Pacific near Japan are called **tsunamis**.

(ii) Cyclones in the Atlantic near the USA are called **hurricanes**.

Explanation:

Cyclones are low pressure systems carrying fast winds. This phenomenon starts on an ocean where hot air being less dense rises and creates low pressure system. As they travel, fast winds accompany them.



Question 2:

(a) Importance of renewable energy

sources:

Renewable energy sources are important because they do not run the risk of depletion. e.g.

Solar energy, wind energy, hydro energy and geothermal energy etc.

Importance with respect to environment:

RESs are environment friendly because they do not produce any harmful gases like CO_2 or methane (CH_4) which may cause entrapment of heat in the atmosphere. These sources do not cause global warming and have the ability to reverse the trend of climate change. Their importance can be summarized as follows:

- I. No risk of depletion
- II. No harmful gaseous release
i.e. no CO_2 , CH_4 , NO_x or SO_x etc
- III. No global warming
- IV. Slowed climate change

Geothermal energy:

Geothermal energy is the energy obtained from heat trapped under the Earth's surface.

e.g. Steam from underground magma and ground water heated under immense pressure and temperature between rocks constitutes geothermal energy.

Uses:

1. Geothermal energy can be used to run turbines and eventually produce electricity directly from steam.

2. Another use is made possible by digging wells of hot water and using that water to produce electricity.

(b) Rocks:

Rocks are solids present in the Earth's crust and are

made of minerals."

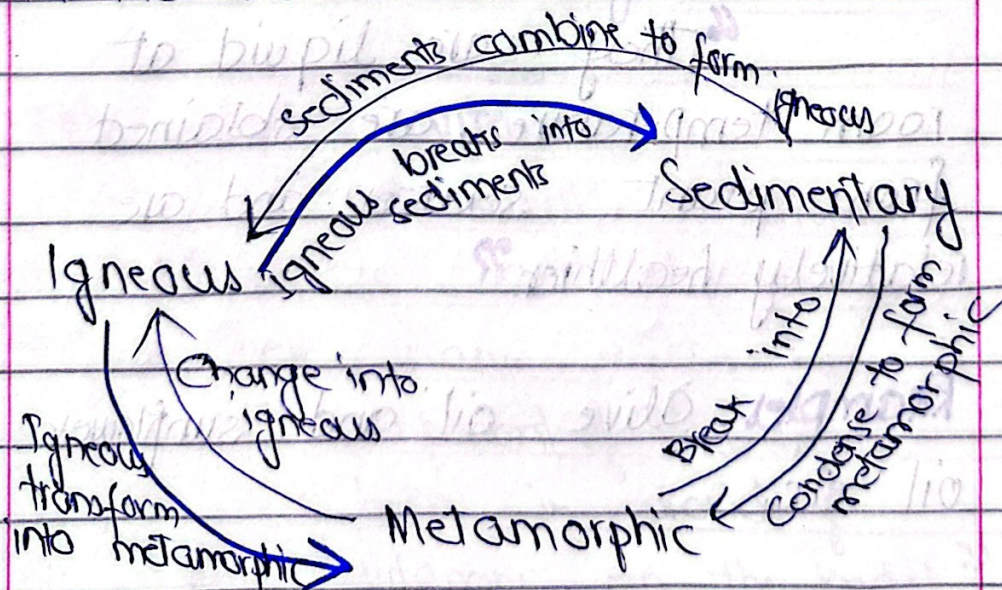
Types:

There are three types of rocks:

- I. Igneous
- II. Sedimentary
- III. Metamorphic

Rock Cycle:

Rock cycle is the vicious cycle of conversion of one rock type into the other and is continuously taking place in the Earth crust.



(C) Saturated vs unsaturated fats:

Saturated fats:

“Saturated fats are solids at room temperature and are obtained mostly from animal sources. They are relatively less healthier than unsaturated fats.”

Examples: Examples are fats from animal sources such as red meat etc.

Unsaturated fats:

“They are liquid at room temperature, are obtained from plant sources and are relatively healthier.”

Examples: Olive oil and sunflower oil etc.

Importance of fats:

1. They are huge reserves of energy. They yield 9.1 calories of energy per gram.
2. They form an essential component of balanced diet although they should make up less than 10% of a person's diet.
3. Unsaturated fats are healthier as they check the accumulation of low density lipoprotein cholesterol i.e. bad cholesterol in the body.

(d) Fat soluble vitamins:

“Fat soluble vitamins are hydrophobic and dissolve in fats as their name implies. Fats are an essential component of balanced diet as they help in providing fat soluble vitamins to the body.”

Examples:

Following are the fat soluble vitamins:

D, A, E, K etc

Importance:

I. Vitamin D is important for calcium absorption by the body.

It prevents rickets in children and osteomalacia in adults.

II. Vitamin A is important for the health of retinal pigments in the eye. Its deficiency causes night blindness.

III. Vitamin E is an important antioxidant and prevents the body from oxidative stress. Its deficiency causes anemia.

IV. Vitamin K is important for blood clotting and its deficiency causes coagulative disorders like hemophilia etc.