

QUESTION NO: 1 (A)

Food Adulteration

DEFINITION

The act of Intentionally debasing the quality of food offered for sale either by the admixture or or substitution of inferior substances or by the removal of some valuable ingredient, is called adulteration.

Example

- Mixing water in milk
- chalk powder in flour

Purpose

Often done for economic purposes, or gain.

Impacts

Cause health issues such as,

- Food poisoning
- Organ damage
- Cancer

Source

"Human" is source of adulteration

Food Contamination:

DEFINITION:

The Unintended presence of harmful biological, chemical, or physical substances in food during production, processing or storage is known as "Food Contamination".

Example

- Pesticide residues on vegetables
- Salmonella Bacteria in meat

Causes:

Poor hygiene, unsafe handling, environmental exposure or equipment malfunction

Impact

leads to acute illness infection

- allergies
- toxicities
- food borne illnesses

Source:

Environmental or operational issues.

Controlling Measures of Food Adulteration

- 1- By enforcing strict legal framework and imposing heavy penalties for offenders, this problem can be solved.
- 2- Routine inspection of food production units, markets and restaurants.
- 3- By spreading awareness in public through use of media and community gatherings.
- 4- By ensuring mandatory quality certification like ISO, this problem can be cured.
- 5- By utilizing advanced testing methods like spectroscopy and chromatography, adulterants can be detected.

B)

Methods Of Food Preservation

Heating

Reducing
Temperatures

Drying

Addition
of AcidsSugar/
Salt

Smoke

Chemicals

Rays

Heating

It is to kill bacteria under high temperature. example pasteurization.

Reducing Temperature (cold)

Freezing slows down microbial activity and prolong life of food. example: frozen vegetables.

Drying

This method is use to dehydrate the food in order to restrict microbial growth. example dried fruits.

Addition of Acids

The use of acids in pickles, in fermentation process, prolong shelf life of the food.

Use of Salt and Sugar Syrups:

Meat can be preserved in salt brine solution. Various fruits preserved in sugar.

Smoke

Smoke containing preservatives like formaldehyde is passed through food to preserve the food.

Use of different chemicals

Ascorbic acids, sodium benzoate and ethyle formate are used to preserve food.

Use of Radiation

By putting certain vegetables protect them from bacteria, in radiation like ultra violet, electro magnetic radiation and microwave, hence prolonging self preservation of shelf life of food.

All above methods are used in food industries or at domestic level to preserve food and prolong life of food.

(C) Weather Variables

Temperature:

The degree of hotness and coldness is called Temperature. It is a physical quantity. It quantifies the degree of hotness and coldness in the atmosphere.

Unit

There are major units

- Celsius ($^{\circ}\text{C}$)
- Fahrenheit ($^{\circ}\text{F}$)
- Kelvin (K)

Instrument:

The instrument used to detect temperature is called "Thermometer".

Explanation:

The higher temperature corresponds to "Summer" while lower temperature corresponds to winter. It is helpful in predicting phenomenon of heatwave, cold fronts and seasonal change.

Pressure :

The force exerted by the weight of the air in a particular area or point. It significantly influences weather patterns and phenomenon.

Unit :

Pressure is force per unit area. the unit of pressure is

- pascal
- atmosphere
- 1 mm Hg
- N/m^2

Instrument :

The instrument used to detect the pressure of the atmosphere is called Barometer.

Explanation :

The areas of high pressure often referred to anticyclones while area of lower pressures are more prone to cyclones. To monitor changes in atmospheric pressure is essential for forecasting.

Humidity

Humidity refers to concentration of water vapour present in the air. It plays a crucial role in weather patterns.

Units:-

The unit of humidity is g/m^3 .

Instrument:

The instrument used to measure moisture in atmosphere is called Hygrometer.

TYPES:

Relative Humidity:

It is ratio of water present to the air.

Absolute Humidity

It measures actual amount of water vapour in the air.

Explanation:

Maintaining appropriate humidity is essential in order to get comfort and better health.

(D)

Phenomenon Of Earthquake

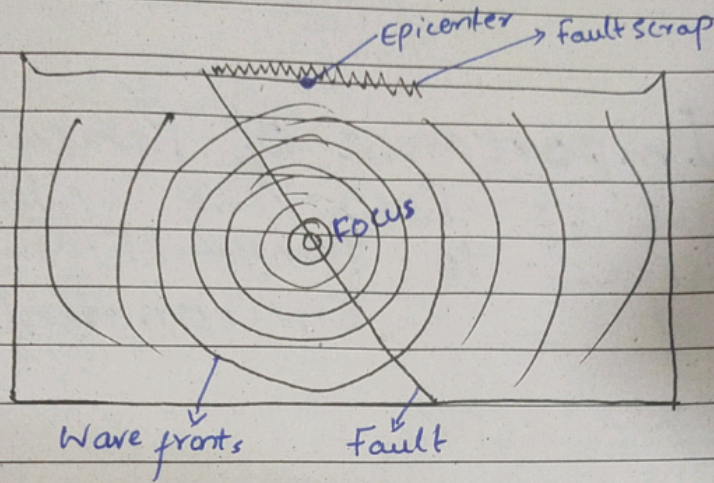
Introduction :

Earthquake is sudden release of energy in the form of seismic activity that create vibration in the earth crust as a result of abrupt movement of tectonic plates.

Causes of Earthquake

The surface of the earth is continuous slow motion. This is plate tectonics. The plate covers the entire surface of globe, during movement they rub against each other or spread apart from each other. At such places the motion is not smooth. The plates are stuck together at the edges but rest of each plate is continuing to move so, rocks along edges are distorted. It is called strain. At a point when strain build up and rock can not withstand further bending, with an abrupt move, the rocks breaks. The Earthquake is the shaking that radiates out from the breaking rocks.

Diagrammatical Representation



The above diagram is showing seismic waves radiate from the focus of an earthquake.

Conclusion:

Understanding the phenomenon of earthquake is very important for developing effective building codes, emergency preparedness plans and mitigation strategies to reduce their impact on human societies.

Question : 02

Part (A)

Importance of Renewable Energy Resources with Respect to Temperature: Environment

Introduction :

Renewable energy resources are naturally replenishing sources of energy that are virtually inexhaustible on a human timescale. They play crucial role in reducing ~~of~~ hazardous effects caused by various factors on environment.

Importances of Renewable Energy Resource :

Renewable energy resources such as, Solar, wind, hydroelectric, geothermal and biomass are pivotal in addressing environmental challenges and promoting sustainable development.

Green House Gas Emission:

Renewable energy resource plays significant role in reducing Green house gases emission, thus making environment safe and sound.

Mitigation of Air Pollution

As renewable resource do not generate pollutants, it improves air quality and public health benefits.

Reduction of Water Usage

Many renewable energy technologies particularly wind and solar require minimal water for operation hence it conserves the water.

Biodiversity Preservation

By minimizing pollution and habitat disruption associated with fossil fuel extraction, Renewable energy resources preserve biodiversity.

Part (B)

Rock. TYPES - Rock Cycle

Introduction :

Rock is a coherent, naturally occurring solid material consisting of one or more minerals.

Types OF Rocks

IGNEOUS ROCKS

The rocks that form from cooling or hardening of magma are called igneous rocks.

SEDIMENTARY ROCKS

The Broken pieces of rock are called Sediments. The Rock formed from sediment is called Sedimentary rock.

Metamorphic Rocks

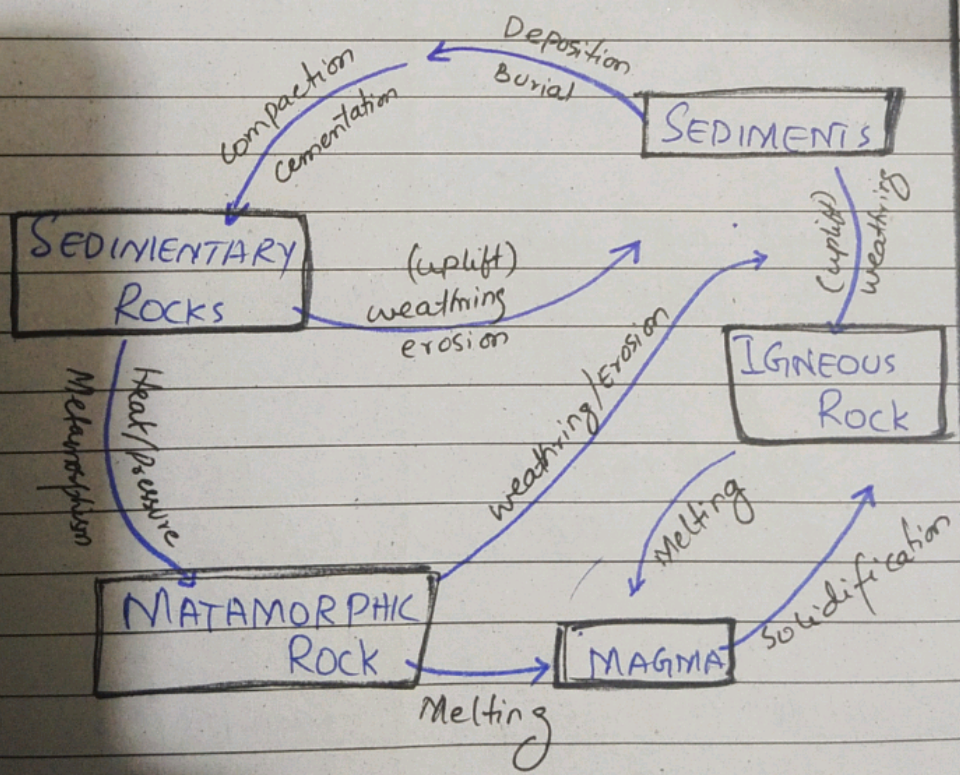
When rock is exposed to extremely ~~heat~~ intense heat and pressure, and it change its shape it is called Metamorphic rock.

Rock Cycle:

The Rock cycle is driven by two forces:

a) Earth internal heat which moves material around in the core and mantle and leads to change in crust.

b) The hydrological cycle, which is the movement of water, ice, and air at the surface and is powered by sun.



(Diagrammatical representation of Rock cycle.

Part (C)

Saturated and Unsaturated
Fats : DIFFERENCE / Importance

Saturated Fats : Unsaturated Fats

(1)	Type of lipids/ fats mostly exist in solid form.	Types of lipids/ Fats exist in liquid form.
(2)	mostly found in the animals.	mostly found in Plants.
(3)	Associated with rise of cholesterol.	Do not associated with rise of cholesterol.
(4)	They have no double bonds in their structures.	They have double bonds in structures.
(5)	They should not be exceed than 10% in diet.	Can be taken upto 20% to 35% in daily diet.
(6)	Example includes - coconut oil - Butter - milk	Examples includes - Vegetable oils - Fish - Sesame

Importance of Unsaturated fats:

Incorporating unsaturated fats in daily diet is essential for maintaining overall health and well being of individual. These health fats offers numerous benefits that support various bodily functions.

- (1) Unsaturated fatty acids prevents us from risk of cardiac arrest as it boost good cholesterol (HDL) and reduce bad cholesterol (LDL).
- (2) It is useful in cell growth and repair, contributing to maintenance of body tissues, throughout the body.
- (3) Unsaturated fatty acid balances the hormones and regulate various physiological process.
- (4) Unsaturated fats control blood sugar and beneficial for diabetic patients.
- (5) Unsaturated fats help in absorption of fat soluble vitamins such as A, D, E, K.

QUESTION: NO: 09

Part (D)

Water Soluble Vitamins:

Vitamins are micro nutrients help in supply of energy to the body. The vitamins which are soluble in water are called water soluble vitamins.

Water soluble vitamins includes,

B1 - Thiamine

B2 - Riboflavin

B3 - Nicotin

B5 - Pantothenic acid

B6 - Pyridoxine

B7 - Biotin

B9 - Folic acid

B12 - Cyanocobalamin

C - Ascorbic acid

USES:

Each water soluble vitamin has unique function. In general their major uses includes metabolism, usage in cellular respiration, oxidation-reduction reactions, fat synthesis, nucleic acid production and collagen formation.

Disease Caused by the Deficiency of Water Soluble Vitamins:

Generally, each water soluble vitamin is associated with particular disease if taken in reduced quantities.

Vitamin	Disease
B1	Beriberi
B2	Breakdown of skin cell
B3	Pellagra
B5	Fatigue
B6	Kidney stones
B7	Depression, nausea
B9	anaemia, birth defects
B12	neurological disorders
C	Scurvy

SOURCES OF Water Soluble Vitamins:

The sources of water soluble vitamins includes

- Green leafy vegetables
- Dairy products
- meat
- Yeast
- grains
- cereals
- Citrus fruits.