

22/10

Question #1:-

(A) Differentiate between Food Adulteration and Food contamination - Give controlling measures of food adulteration.

### Understanding the Concept of Food Adulteration and Food Contamination:

Both the Food Adulteration and Food Contamination refer to the presence of an unwanted thing in the food. The only difference lies in the way the thing is added or placed.

#### I. Food Adulteration — An Intentional Process:

Food adulteration is an intentional way of adding harmful thing in the food. The purpose of food adulteration is to cope with the cheap prices in the market while retaining the greed of profit.

Ways of Food adulteration involves the use of cheap oil, adding limestone, stones etc. and similar things in the food just to increase the weight and meet the market demand.

## II. Food Contamination - An Unintentional Process

Food Contamination refers to the situation in which food is contaminated or becomes poisonous due to unintentional ways. The food may be contaminated by its raw material or during its packaging or processing.

Ways of food contamination includes the addition of a damage part in raw material, misplacing of a thing like stone or plastic during processing which affect the overall quality of food.

## Impacts of Food Contamination and Food Adulteration on Human Beings:

Both the food adulteration and food contamination have severe impacts on the health of human beings in the form of:

- (1) Vomiting or Nausea
- (2) Diarrhoea
- (3) Breathing difficulty
- (4) Severe cough leading to lungs infection.

## Ways to Control and Prevent Food Adulteration:

Food Adulteration can be prevented by the following ways:

(1) Keeping checks and Balance on the factories

(2) Educating masses regarding quality of food

(3) Initiating Special Committees to check the production houses

(4) Introducing <sup>harsh</sup> penalties to those who perform food adulteration to create deterrence

(5) Introducing laws regarding those who earn profit by unlawful means

Moreover, countries like Pakistan, being agriculture country, can prevent it by addressing the issue on grassroot level like checking the fault in crop or food to be processed.

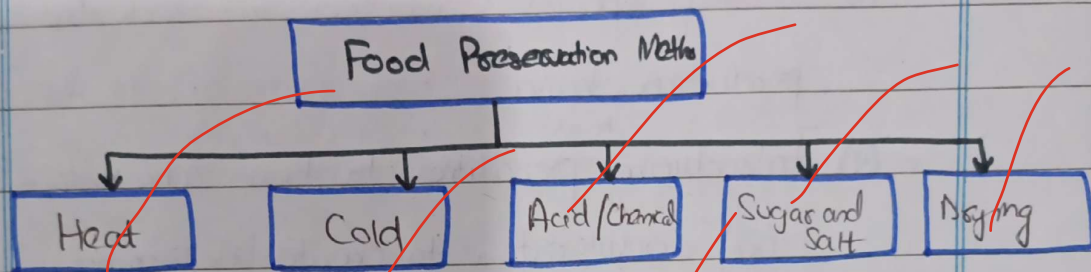
(B) Describe the five food preservation methods with examples.

### Understanding the term "Food Preservation":

The word preserve originally means to

store something. Food preservation refers to the ways in which food is preserved in homes, or industries.

## Key Ways to Preserve the Food at Domestic or National Level:



The food preservation methods vary from traditional methods (Sugar and Salt, drying<sup>heat</sup>) and modern methods (Heat, Cold, Acid/Chemical).

### I. Heating Method of Food Preservation:

Heating is a very common method of food preservation. In this method the <sup>excess</sup> heat is provided to remove or destroy the micro-organisms in the food or sometimes providing mild heat remove active enzymes. Moreover infrared radiation is also used in the method.

Example: Boiling milk to remove micro-organisms

and use it for long time.

## II. Cooling method of food Preservation:

Cooling method is also a way of food preservation in which the food is cooled or frozen below the freezing point i.e.  $0^{\circ}\text{C}$  to be used for later. It may change the color of food but the food may be stored for a long duration of time.

**Example:** Frozen Items eg:- Kababs, Parathas etc.

## III. Acid or Chemical Method of food Preservation:

In an acidic or chemical method, a chemical is used in the food to be preserved for a period of time. However, the acid does not affect the health of consumer.

**Example:** Adding Vinegar to the vegetable to make pickle and preserve them.

## IV. Sugar and Salt Method of food Preservation:

The Sugar and Salt method are two

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separate methods. In some foods, sugar is added to increase the lifetime of food. **For Instance**, Sugar is used in jams or Mursabans. On the other hand, <sup>in</sup> some foods salt is used to make the food useable for a period of time. **For Instance**: Salt <sup>was</sup> used in old ages to preserve meat as it absorbs the excess water.

## II. Drying Method of Food Preservation:

In the drying method, food is dried by providing excessive air or using sunlight. It also removes <sup>natural</sup> water and organisms which can damage the food. **For Instance**: Beef is dried in some villages by cutting it in form of strips and placing in sunlight to be used later.

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(c) Explain the following weather variables:

### I. Temperature:

Weather forecasts refer to the day-to-day weather updates of a region. In weather forecast, the most important element is the temperature of the region which is usually

in  $^{\circ}\text{C}$  or  $^{\circ}\text{F}$ . The temperature defines the level of coldness or hotness in the region.

### Example:

The temperature is  $5^{\circ}\text{C}$  shows that there is a cold weather. On the other hand, a temperature of  $18^{\circ}\text{C}$  or  $25^{\circ}\text{C}$  indicates normal temperature.

Moreover, temperature is the main element which explains other forecasts like humidity, wind etc.

## II. Pressure:

The pressure in weather forecast refers to the air pressure or wind pressure. The wind pressure indicates if the weather is cool or warm. The wind pressure in hilly areas is mostly high due to the large mountains. However, the desert areas have low pressure winds in day time and high-pressure winds in the night.

### Example:

The wind pressure of 5 mph (miles per hour)

indicates cool weather.

### III. Humidity:

Humidity refers to the level of the presence of moisture in the atmosphere. The moisture refers to the water vapours which are basically formed due to evaporation process.

#### Example:

The presence of <sup>more</sup> moisture in a region may indicate a cold temperature or chances of rain.

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### (D) Explain phenomena of Earthquake

#### Understanding the Concept of Earthquake:

The phenomena of Earthquake refers to the situation in which seismic waves are formed due to the breakage of the rocks present below the surface of earth.

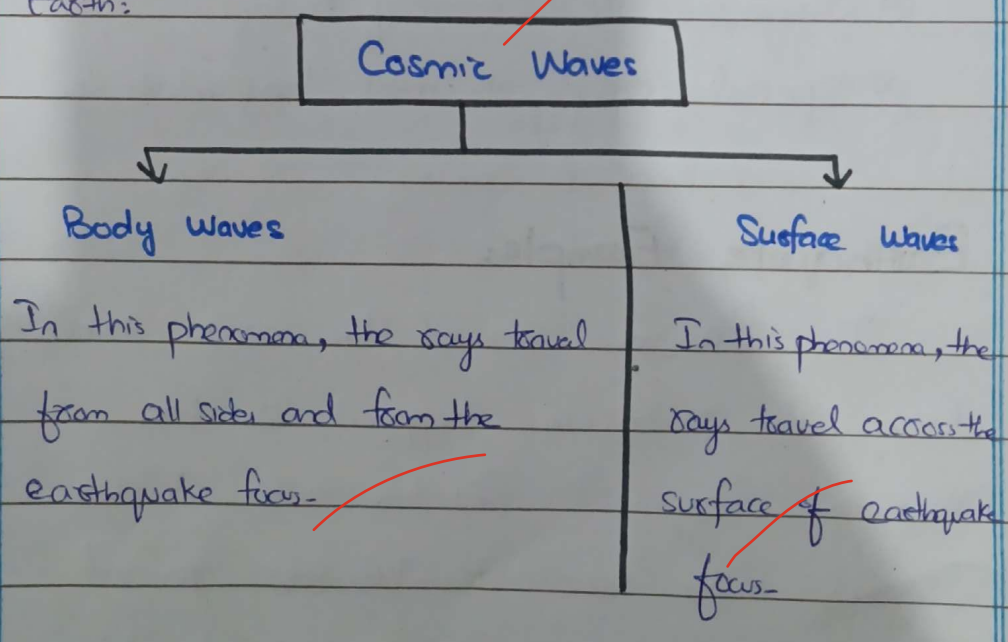
#### The Process of Formation of Earthquake:



Earth contains plates below its surface. These plates are in <sup>slow</sup> motion. They usually converge each other, diverge each other or slip past one another. There is a point when the edge of two plates get stuck but the rest of plate tries to move. At that point, a stress is created which results in the break of the plates. The point where the crack happens is called focus and on the surface of earth it is epi-centre.

### Types of Cosmic Waves in Earthquake

These are two types of cosmic waves in Earth:



## Impacts of Earthquakes on a Region:

Earthquake results in severe impacts on the region where it happened. Most common impacts are:

- (1) Loss of Habitants
- (2) Loss of Property and Economy
- (3) End of flora and fauna

## Ways to Prevent Earthquakes:

To prevent earthquakes from happening, following ways to be adopted:

- (1) Introduction of Zoning Concept
- (2) Change in the structure of Buildings
- (3) Special camps in most targeted regions.

## Earthquake Example:

In Pakistan, one of the most severe forms of earthquake happened in the Northern Region of Pakistan in October 2005, with magnitude 7.6 as measured by seismograph.

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## Question # 2:-

(A) Give importance of Renewable Energy resource with respect to environment and explain solar energy.

### Understanding the Concept of Renewable Energy:

The renewable energy refers to the process of attaining energy through natural processes. These natural processes refer to the wind, water, biological material (biofuel), and Sun.

### Importance of Renewable Energy:

The renewable energy plays a very vital role in attaining it and also preventing environment from further hazards of Greenhouse gases.

#### I. Prevention From Economic Crisis:

The production of renewable energy helps us (Pakistan) to increase the GDP (Gross Domestic Production) - since the raw material is

already at home - So, only the money will be spent on the processing technology. Moreover, the oil prices in the world are very high due to crisis -

## II. Reduced Dependence on Foreign Reserves:

Pakistan depends on foreign countries for production of electricity, cars and oil. The use of renewable sources would reduce the dependence on foreign countries and would make the country self-sufficient and independent.

## III. Reduction in the Inflation:

The production of energy at home would have decrease the value due to absence of extra tariffs or taxes. So, ultimately the buying capacity of country will be increased which would lead to the decrease in inflation.

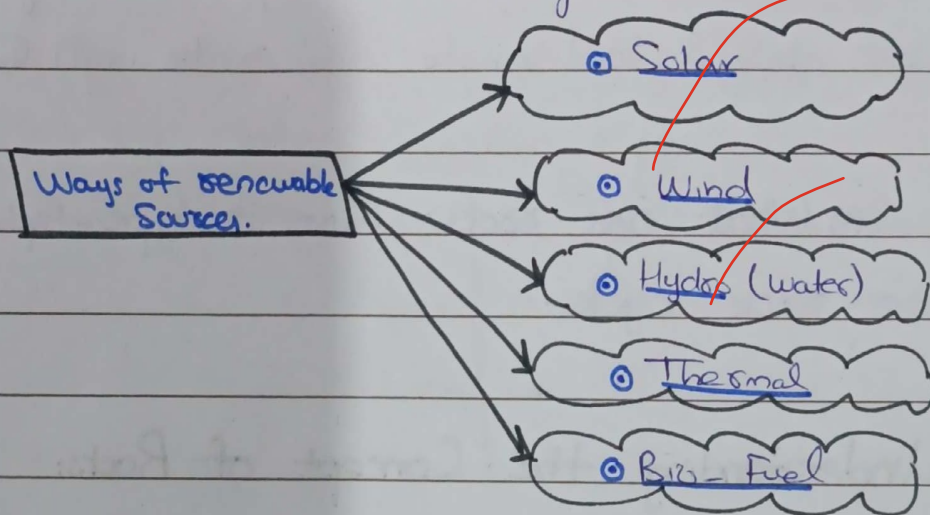
## IV. Reduction in the Greenhouse gases:

The presence of non-renewable energy sources are polluting the environment. Introducing renewable energy sources would reduce the

further enhancement of emission of  $\text{CO}_2$  leading to a clear and non-polluted environment

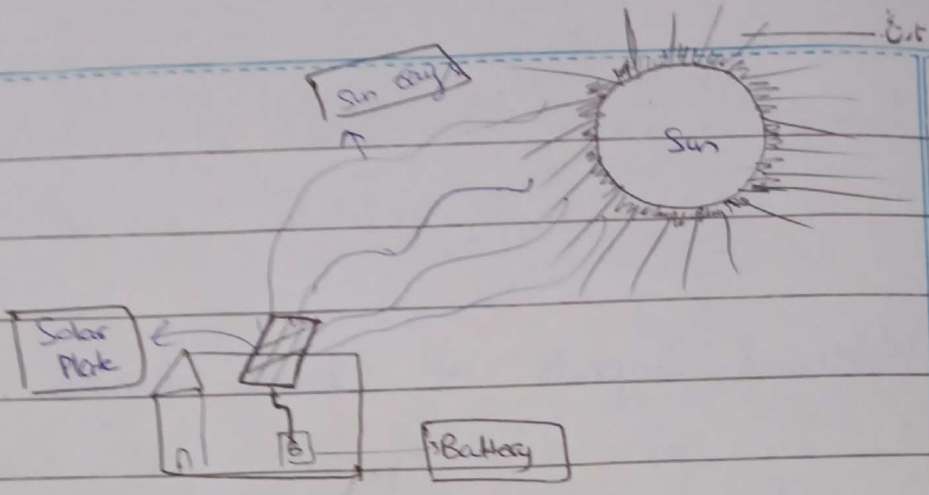
## IV. Reduced Impacts of Climate Changes:

The presence of non-renewable energy sources would reduce the impacts of hazardous gases which are polluting the environment - So the risk of climate change would also be reduced.



## I. Understanding the Process of Attaining Solar Energy:

Solar energy is the one of the renewable energy sources. In this process, the rays of sunlight reaching the ground are used to charge the battery of the plates.



The rays of sun are reflected on the solar plate which gets the power and sends it to the attached battery. The battery gets charged and may be used in the night time.

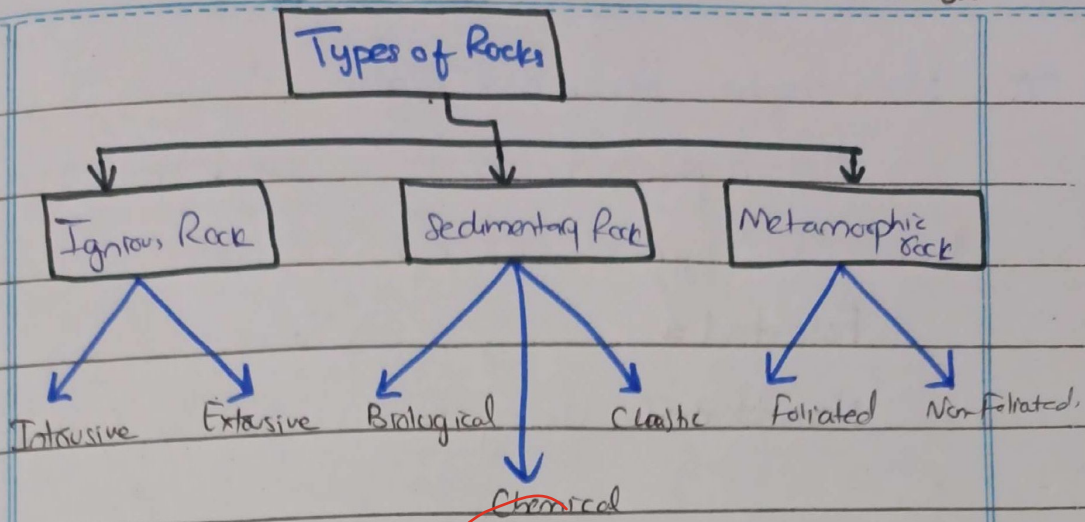
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(B) What are rocks: Give its types - Explain the rock cycle.

### Understanding the Concept of Rocks:

Rocks are the solid material present on the surface of earth and formed due to the material present inside the earth.

### Types of Rocks on the Surface of Earth:



## I. Igneous Rock and Types:

Igneous rocks are formed due to cooling of molten magma present inside the earth. The two types of igneous rocks are:

### Intusive Rocks

Intusive rocks are formed when the magma cools down inside the surface of earth.

### Extusive Rocks

Extusive rocks are formed when magma cools above the earth surface.

## II. Sedimentary Rocks:

Weathering process is applied to breakdown the rock into small pieces known as sediments. Following are the main types of sedimentary rock:

- A. **Biological:** The sediments are formed due to biological process.
- B. **Chemical:** The sediments are formed due to the imposition of chemical.
- C. **Clastic:** The sediments are formed due to physical process.

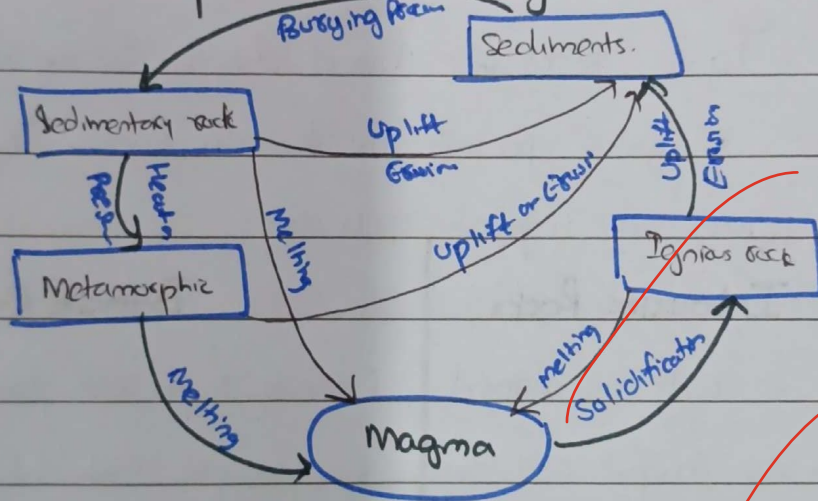
### III- Metamorphic Rocks and Types:

Metamorphic rocks are those which have many forms - Two types of metamorphic rocks are:

Foliated = Having many layers.

Non-Foliated = Having no layers and irregular shape.

### The Concept of Rock Cycle:



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First the molten magma cools down on the earth's surface and forms Igneous rocks. Then the Igneous rock undergoes through an uplift and erosion forming sediments. These sediments when buried together form Sedimentary rock. The sedimentary rock then undergoes through a heat & pressure forming layers on the rocks resulting in ~~metamorphic~~ metamorphic rocks. and again if they are melted the rocks can be converted to magma and process continues.



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(c) Differentiate between Saturated and Unsaturated fats. Give its importance.

Fats are found in human body and also in the plants and animals. Following are main types of fats. They are naturally occurring organic compounds.

### I. Saturated Fats:— A Key Concept:

Saturated fats are those which are solid at room temperature. They are mainly found in the animal meat, and its related products like poultry items. Moreover, they are also found in sea food. In some oils like coconut oil and palm oil, saturated fats are present. Saturated fats are not good for health. If they are eaten in large amount they can result in blockage of heart <sup>vessels</sup>.

### II. Unsaturated Fats:— A key Concept:

Unsaturated Fats are those which are liquid at room temperature. These fats are good for human health. The two

important types of unsaturated fats are:

### (A) Mono-unsaturated Fats:

<sup>They are</sup> Found in Almonds, canola oil and other vegetable oil. They are highly recommended for consumption.

### (B) Polyunsaturated Fats:

They are used to enhance good LDL (low density lipoprotein) in human body. Found in Sunflower oil etc.

## Importance of Fats in Human Body:

Fats are both highly essential and ~~at~~ the same time hazardous for human body. Because:

(1) Saturated fats are solid and may lead to obesity and heart attack.

(2) Unsaturated fats are highly recommended for body because they are liquid and do not block blood vessels.

(3) Fats provide energy to human body.

(4) Fats are organic in nature.

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(D) Give a brief of water-soluble vitamins.

### Introduction to Vitamins:

Vitamins are highly essential for human body along with minerals to enhance the energy production nutrients. They are generally of two types and are not stored in body. So, need to be taken.

(1) Fat-Soluble Vitamins (Vit A, D, E and K)

(2) Water Soluble Vitamins (B complex, C)

### Water Soluble Vitamins, and Their Benefits:

Water Soluble vitamins generally consist of the following vitamins:-

(1) B<sub>1</sub>

(2) B<sub>2</sub>

(3) B<sub>3</sub>

(4) B<sub>5</sub>

(5) B<sub>7</sub>

(6) B<sub>9</sub>

(7) B<sub>12</sub>

(8) C

#### I- Vitamin B<sub>1</sub>:

Vitamin B<sub>1</sub> is generally found in legumes, and pulses. It is essential for muscle

strength - Deficiency will cause the Beri-beri-

## II. Vitamin B<sub>2</sub>:

Vitamin B<sub>2</sub> is normally obtained from the vegetables, grains, and dairy products - It helps in cellular respiration - Its deficiency lead to Eyes Irritation and inflammation to skin.

## III. Vitamin B<sub>3</sub>:

It is generally found in legumes, grains, cereals, <sup>leafy</sup> vegetables - It helps in the digestion process and cellular respiration - Its deficiency leads to pellagra.

## IV. Vitamin B<sub>5</sub>:

It is found in grains, poultry product meat, eggs and legumes - It helps in energy metabolism - and if deficiency <sup>occurs</sup> will lead to fatigue and loss of concentration.

## V. Vitamin B<sub>6</sub>:

It is found in poultry products, leafy

vegetables and grains - It helps in the metabolism.  
Its deficiency would cause kidney stone.

#### II. Vitamin B7:

Vitamin B7 is generally found in vegetables, grains, fruits and legumes. It helps in the formation of energy and <sup>strong teeth</sup> stress-free body. Its absence will lead to fatigue, <sup>and</sup> depression.

#### III. Vitamin B9:

It is generally found in meat, eggs and dairy products. It helps in the formation of strong muscles and mind. However, its deficiency leads to neurological disorders.

#### IV. Vitamin B12:

This vitamin is highly essential for human body. It is found in eggs, meat and grains. It also helps in neurological functions and absence would lead to neurological disorders.

#### V. Vitamin C:

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Vitamin C is found in oranges, fruits and vegetables. These are essential for human skin. However, deficiency leads to ~~skin~~ problems including dullness and dryness.

### Importance of Vitamins:

Vitamins are essential for human body ~~for~~ preventing it from diseases like beriberi, tooth decay, stress release and also for good skin. So, they need to be taken by diet because they are not stored in body and get out of the body through urine.

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