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## 1. (A)

### Food Adulteration vs Food Contamination

Aspect	Food Adulteration	Food Contamination
Definition	Intentional addition of inferior, harmful, or substandard substances	unintentional presence of harmful substances e.g. microbes/toxins
Purpose	often done to increase quantity, reduce costs, or enhance appearance	usually accidental, occurring during food production/storage
Examples	<ul style="list-style-type: none"> <li>• mixing water in milk</li> <li>• adding synthetic colors to spices</li> <li>• starch in ghee</li> </ul>	<ul style="list-style-type: none"> <li>• presence of bacteria like Salmonella, or mold in food</li> </ul>
Legality	illegal and punishable under food safety laws	often not intentional, but can lead to penalties if preventive measures ignored
Detection	requires chemical analysis or lab tests to detect adulterants	Detected via microbiological test or observing visible spoilage signs

# Quality Standards

→ ensure food products meet WHO/FDA standards

## Public Awareness

→ educate consumers on how to identify common adulterants

Strict Enforcement of Laws  
→ conduct regular inspections

## Controlling Measures for Food Adulteration

### Labelling and Certification

→ ensure proper labelling of items

→ e.g. ISO

22000 Technology certificate Adoption

→ use advanced tech such as

blockchain for traceability and quality checks in food supply chains

### Testing Labs

→ establish accessible food testing labs

for consumers to verify food authenticity

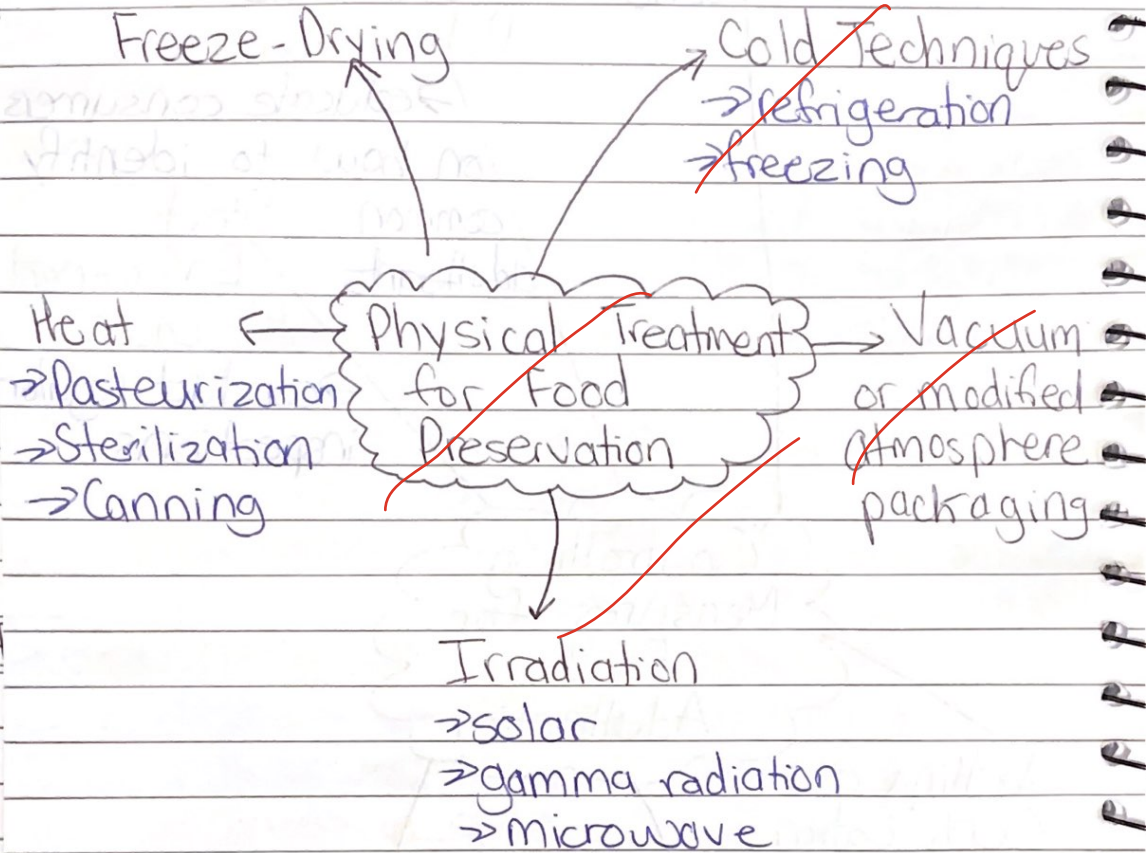
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Q. 1 (B)



Five Food Preservation Methods:

① Drying (Dehydration)

→ removal of moisture from food to prevent growth of microorganisms, which require water to thrive

→ e.g. dried fruits (raisins, dates, apricots)  
powdered milk  
instant coffee

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## ② Freezing

→ lowering temp of food to slow down the activity of bacteria, yeast, mold

↳ e.g. frozen vegetables (peas/spinach)  
frozen meat + seafood (chicken/fish)

## ③ Canning

→ sealing food in airtight containers and heating to destroy microorganisms

↳ suitable for both home preservation and large-scale production

↳ e.g. canned beans, soups, fruits  
tomato sauce  
condensed milk

## ④ Pickling

→ preserving food in an acidic solution (e.g. vinegar / brine) that inhibits microbial growth

↳ e.g. pickled cucumbers, olives, onions  
kimchi / sauerkraut

## ⑤ Pasteurization

→ heating food to a specific temp for a set period to kill harmful microorganisms while retaining quality

↳ e.g. pasteurized milk  
pasteurized eggs

③



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## Q. 1 (C)

### ① Temperature

↳ Definition = measure of how hot/cold the atmosphere is. The amount of heat (kinetic energy) in the air. Reflects the energy of air molecules

↳ Units = degrees Celsius/Fahrenheit, or Kelvin

↳ Instruments = measured using a thermometer

↳ Significance = determines daily comfort levels (hot/cold/mild). Influences weather patterns like rainfall, wind, evaporation rates

### ② Pressure

↳ Definition = the force exerted by the weight of the air above a surface i.e. the force exerted on an object by the air around it. Air pressure is highest at the Earth's surface, and decreases with altitude

↳ Units = measured in millibars, hectopascals, or inches of mercury

↳ Instruments = measured using a barometer

↳ Significance = high pressure generally lead to clear, calm weather. Low pressure often results in cloud, rainy, or stormy weather

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### ③ Humidity

↳ Definition = the amount of water vapor in the air. Higher humidity makes the air feel warmer, while lower humidity makes the air dry.

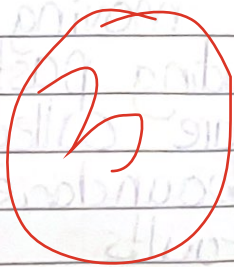
↳ Types = Absolute Humidity = actual amount of water vapor in the air

Relative Humidity = percentage of water vapor in air compared to its maximum holding capacity at a specific temp

↳ Units = measured as a percentage (%)

↳ Instruments = measured using a hygrometer or a psychrometer

↳ Significance = high humidity makes air feel warmer and can lead to discomfort/perspiration. Low humidity is associated w/ dry conditions, which can cause skin dryness and respiratory issues.



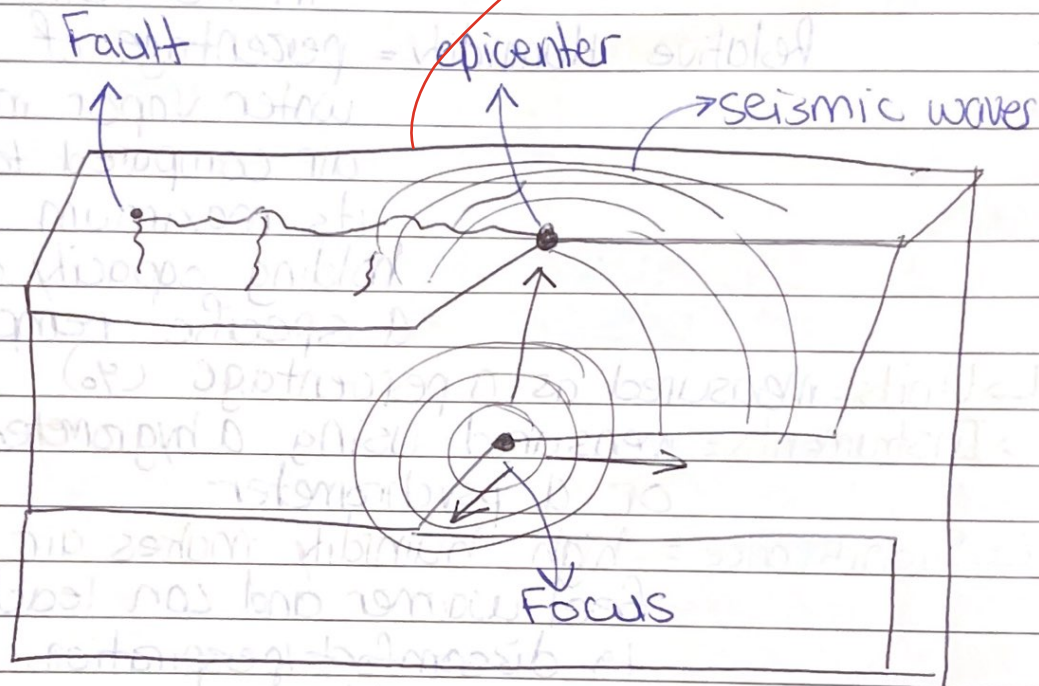


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Q. 1 (D)

Definition = a sudden release of energy in the form of seismic waves that create vibrations in the Earth's crust as a result of abrupt movement of tectonic plates



Causes of Earthquakes:

① Tectonic Plates

→ Earth's crust is made up of many tectonic plates that are constantly moving, bumping into each other, and sliding past one another.  
→ edges of the plates are called plate boundaries, and these boundaries are made up of many faults

→ as plates move, stress build up along the faults

→ when stress builds up enough, rocks along the fault suddenly slip, releasing energy in the form of seismic waves

→ these waves travel through Earth's crust and cause the ground to shake

## ② Volcanic Activity

→ as magma rises to Earth's surface, it can cause surrounding rocks to fracture, leading to volcanic earthquakes

## Classification

Based on Magnitude (Richter Scale)

↳ Minor = less than 4.0

↳ Moderate = between 5.0 and 5.9

↳ Great = 8.0 and above

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