

12/11/2025Day: WednesdayRSA - 3Question #1Solar Eclipse

- a) Solar eclipse occurs when moon comes in between the earth and the sun. It does not happen frequently because the revolution of moon is 5° tilted. Hence, the alignment occurs less frequently, which causes Solar eclipse.

Lunar Eclipse

Lunar Eclipse occurs when the earth comes in between the sun and the moon. This results in the shadow of the earth on the moon, giving it a partial or full obscurity. Lunar Eclipse are more frequent than solar Eclipse. Figure 1 shows a general outlook of Lunar Eclipse.

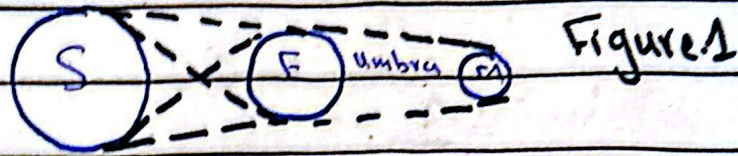


Figure 1

Sun Earth Moon

* As shown in the diagram, Earth has fully obscured sunlight from reaching moon.

Types of solar eclipse

Full-solar Eclipse

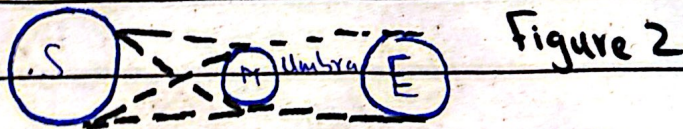


Figure 2

Sun Moon Earth

Full-solar Eclipse occurs when the moon is closer to the earth or the sun is far away. Thereby, fully obscuring the light of sun from

reaching the earth surface. This has been clearly illustrated in figure 2, as the sun rays are blocked by moon.

Partial-solar Eclipse

Figure 3



| Sun

| Moon

| Earth

As shown in Figure 3, partial solar eclipse results in partial blockade of sunlight by the moon from reaching the earth. From eye view, it can be seen in disc-shaped form.

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b) Differences

Plastic	Ceramics
1- Plastic are soft, malleable items	1- Ceramics are hard, non-malleable items
2- Plastic, when force is applied, deforms	2- Ceramics, when force is applied, breaks

Types and application of Ceramics

Types	Application
1- Hard and brittle	Used in cements for construction
2- Shiny and enduring	Used in making luxury home tiles

c) Differences between food contamination and food adulteration and their examples

Food Contamination

1- It is done intentionally or unintentionally.

2- It involves mixing other things with food.

3- It may occur for commercial purposes or negligence

Examples

1- Mixing water with milk

Food adulteration

1- It occurs naturally.

2- It involves the degradation of food.

3- It may occur due to specific environment, time and lack of food preservation

Examples

2- Oxidation process in food

Food Contamination

Food Adulteration

2- Mixing Furniture powder in spices

2- Bacterial growth, resulting in loss of food quality

3- Toxic chemicals during food processing

3- Enzymatic reactions degrading nutritional value

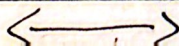
4- Injecting water into water melons

4- Moulds appearing on food

5- using unhygienic hands to handle cooking

5- Physical changes due to pressure

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d) Definition of imbalanced diet

Imbalanced diet is excessive of certain nutrients or deficiency of nutrients or both. This results in negative health implications. Diet is the composition of nutrients taken by an individual. An Imbalanced diet could result in deficit / excess intake of Protein, Fats, Carbohydrates, Fibres, Vitamins or minerals.

Consequences of unbalanced diet

Fats

Excess of fats risks heart diseases and obesity, especially the intake of saturated fats.

Deficit in fats may result in loss in body weight, effect in tissue function and problems of nervous system.

Protein

Protein

Excess in protein results in kidney stones. Whereas, the lack of it cause Kwashiorkor and anemia.

Carbohydrates

Excess Carbs would result in obesity and diabetes. Whereas, low Carbs reduces energy and would result in ketosis.

Minerals

Excess in minerals such as Sodium can cause blood pressure. Whereas, the lack of it may effect formation of red blood ~~cells~~ such as iron ~~requirement~~ in hemoglobin.

Vitamins

Lack of vitamins may result in some issues like Osteoporosis due to Vitamin D deficiency. an

for other hand, excess could result in liver issues such as Iron excess.

Fibre

Fibre results in the inhibition of absorption of certain nutrients if consumed excessively. However, it can result in complications like constipation if it was not taken sufficiently.

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Question # 2

Traditional Food Preservation

Methods:-

1) use of vinegar

2) Use of salts to dry the food

Modern Food Preservation

Methods:-

1) Vacuumed packaging and boiling

2) Use of cold storage

Traditional food preservation

3) Sun dried items

Advantages:-

1) less cost of preservation

2) may not have any side effects over consumption

3) Food preservative, readily available

Disadvantages:-

1) Time taking to ensure preservation

2) May be applicable

Modern food preservation

3) Food additives

Advantages:-

1) More efficient preservation methodologies

2) time efficient during the process

3) Covers a wider variety of food items

Disadvantages:-

1) Costly in processing, food additives, storing

2) has negative side effects

Traditional food Preservatives

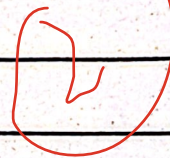
on certain varieties of food

3) May result in ^{actual} loss of taste such as vinegar preservation

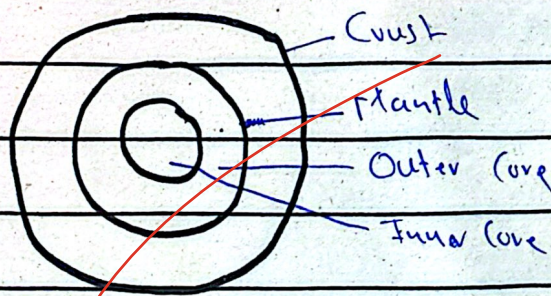
Modern food Preservatives

if certain food additives were added

3) loss in nutritional value during boiling

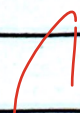


b) Internal Structure of earth



Crust

Crust is the outer surface of the earth, composed of lithosphere. It can be considered as the hard outer



layer of the earth which floats on the mantle. Hence, it is divided into large plates such as Arabian and Indian plates.

Mantle:

Mantle is divided into semi-molten and rock hard state. The semi-molten mantle's movement causes earth plates to hit, resulting in earth quake. The hard mantle remains solid due to pressure and is not involved in convection activities. It covers an area of asthenosphere.

Core

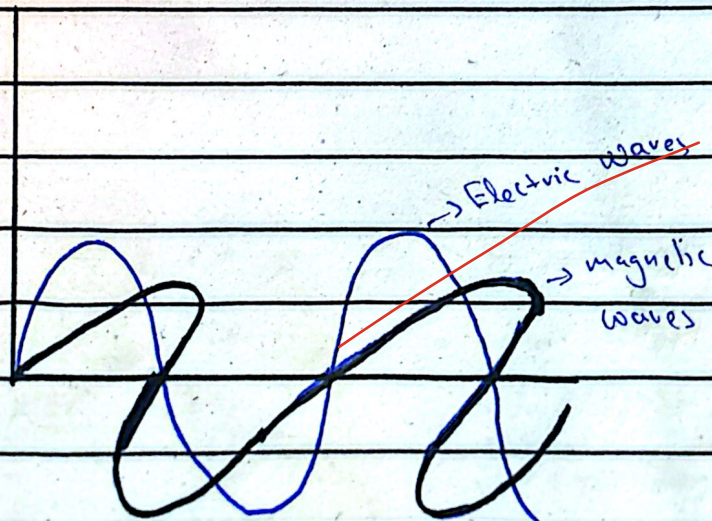
Core is also divided into outer and inner core. Outer core is in molten form and is responsible for generation magnetic wave around the earth through convection. The inner core is solid due

to pressure, as pressure ~~reduces~~ boiling increases boiling point. The temperature of core is around 7000°C .

c) Definition of electromagnetic radiation

Electromagnetic waves are the simultaneous and combined frequency of both electric and magnetic wave as shown in the figure below. Electromagnetic radiation is divided in different types based on its frequency and wavelength.

Types of



Types of electro magnetic radiation

Radio waves	Micro waves	UV rays	Sunlight	X rays	Gamma rays
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→ As we move towards the right, Frequency increases while the wave length decreases.

Applications

Radio waves

- radio signals for communication.

Micro waves

- T.V remote
- microwave oven.

UV rays

- to maintain earth's temperature.

Sunlight

- for photosynthesis by reaching with Chlorophyll.

X rays

- to diagnose broken bones in a patient or pregnancy in women.

Gamma rays

- to detect any breakage in pipes
- to measure thickness of lead.

d) Definition of Disaster Risk Management (DRM)

Disaster Risk Management (DRM) is the process of dealing with a natural or manmade disaster by the state & the country. In Pakistan Provincial Disaster Management Authority (PDMA) and National Disaster Management Authority (NDMA) are functional bodies of DRM. DRM framework includes risk assessment, response, recovery and Preparedness.

Preparedness

Assessing the risk and prepare accordingly to prevent / Minimise the cost to disaster. It is a preventative measure

Response

Response of DRM after the disaster has occurred. The effects of disaster are

assessed and response made accordingly.

Recovery

Recovery is the long-term process of rehabilitation and restoration of the area affected.

Importance of Risk Assessment in DRM

Risk assessment in DRM helps in calculating the total cost of the disaster and making preparations accordingly.

These preparations will include taking both preventive and reactive measures.

A state will gather funds, human resource and other resources to minimize the disaster impact and work on effective response. It will avoid the great cost of disaster and the state could adopt sustainable strategies such as removal of urbanization or construction from flood prone areas.

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