

Section 1

Q 2. What is dengue? Give a brief account of its causative agents and its symptoms.

Definition of Dengue:

Dengue is a break bone fever. It occurs because of a mosquito called *Aedes aegypti*. It is an endemic disease. When mosquito bites, it transfer the virus to human body and works as a vector for the virus. It requires blood to produce eggs.

Causative agents of Dengue:

Caused by several species of mosquito within the genus *Aedes*. primarily *A. Aegypti*.

Symptoms of Dengue:

Symptoms of Dengue usually begin four to five days after infection and may include

- 1- Sudden high fever
- 2- Severe headache
- 3- Pain behind the eyes
- 4- Severe joint and muscle pain
- 5- fatigue, Nausea, Vomiting
- 6- Skin rashes, mild bleeding etc.

Treatment:

Pain relievers usually acetaminophen

b) Explain dark matter and dark energy?

Dark Matter:

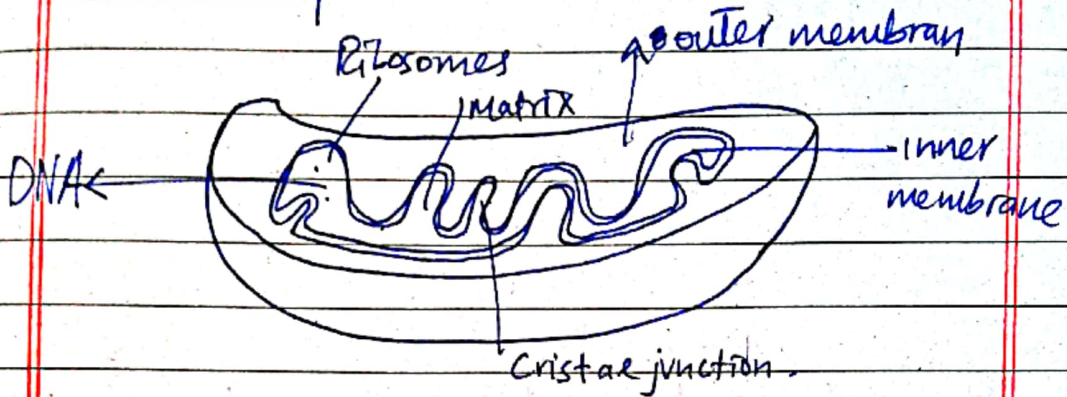
Dark matter is composed of particles that is believed that they do not absorb, reflect or emit light. So they cannot be detected by observing electromagnetic radiations. Dark matter is a material that can not be seen directly. Dark matter makes up about 27% of of energy in the universe.

Dark Energy:

Dark energy is the name given to a force that is believed to be making the universe larger. Distant galaxies appear to be moving away from us at high speed. And it is expanding since big bang theory it is considered that dark energy is roughly present 68% in the universe.

- c) Draw structure and function of mitochondria.
How is it the powerhouse?

Structure of Mitochondria:



Functions of Mitochondria:

- 1) Regulates metabolic activity of the cell.
- 2) Help in detoxifying ammonia in a liver cell.
- 3) Promotes growth of a new cell and cell multiplication.
- 4) Plays role in apoptosis or programmed cell death.
- 5) Produces energy through the process of cellular respiration.

Mitochondria as a Power house of the cell.

It is called the powerhouse of the cell because it produces the energy necessary for the cell's survival and functioning. It breaks glucose into energy known as Adenosine triphosphate (ATP), which is used as a fuel for many cellular processes.

Date: _____

d) What are covalent bonds? Explain types along with elaborating structures.

Covalent bond:

Covalent bond involves the sharing of a pair of valence electron by two atoms in contrast to ionic bond. It leads to stable molecule bonding in such a way that it creates noble gas configuration.

Following are the types of covalent bonds

1) Polar covalent bonds:

The electrons are unequally shared due to differences of electronegativity of atoms.

2) Hydrogen bond:

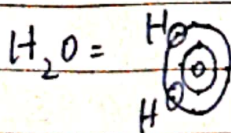
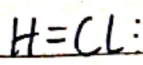
In this bond, a dipole dipole attraction is present.

3) Metallic bond:

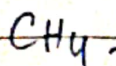
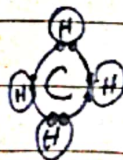
In this bond the metal nuclei ^{share} free valence bond. They are not confined to one atom.

Examples:

Polar covalent bond



Hydrogen bond



Metallic bond

Q4. What is noise pollution? Give its harmful effects and ways to curb it?

Noise Pollution:

Noise pollution or sound pollution is any unwanted or disturbing sound that affects human health, wildlife and environmental quality.

Harmful affects of Noise Pollution:

It creates annoyance, cardiovascular diseases, metabolic system, cognitive impairment in many individuals. Sometimes it also causes sleep disruption and lost productivity. The examples include the noise from heavy machinery, vehicles and horns etc.

Ways to curb Noise pollution:

- 1) Turning off heavy noise creating appliances
- 2) Use of insulating material in construction
- 3) Use of earplugs in noisy areas
- 4) Lower interaction with high volume
- 5) Staying away from noisy area
- 6) Less use of horns etc
- 7) Promotion of quite zones and noise free areas.

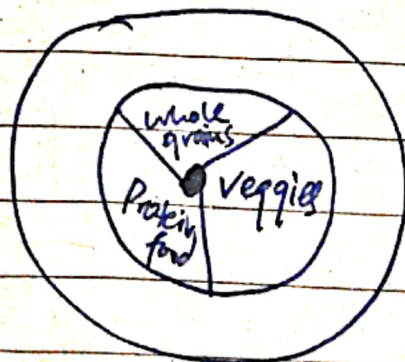
b) What is the importance of fibres in diet
How would be a platter of food considered balanced?

Importance of fibres:

The dietary fibres keep the digestive system healthy. It includes bulk and roughage. They improve the absorption of water and electrolytes, regulate immune system, fight inflammation and even help suppress tumor growth in the colon. It also prevent constipation.

What is a balanced platter:-

A balanced platter includes proteins, carbohydrates, vegetables, fruits etc. It has all the components needed for fulfilling the energy requirements in the form of minerals, vitamins and micro and macro nutrients.



∴ Balanced platter.

c) Elaborate drinking water quality and standards.

Water Quality:

Drinking water quality are the parameters set for safe drinking water. The water that is usually not harmful and free from any bacteria is deemed as safe drinkable water.

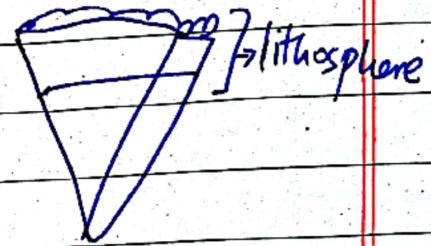
It entails following features:

- 1) Free from toxic substances,
- 2) Contaminants etc
- 3) Excess mineral content
- 4) divalent ions
- 5) Organic matter
- 6) Its range of pH should be 6.5 - 8.5
- 7) Clear appearance
- 8) Odorless

d) Explain lithosphere. What are rocks & minerals?

Lithosphere:

Lithosphere is a rigid outermost shell of earth. It is composed of the crust and the portion of the upper mantle that behaves elastically on time scales of thousands of year or greater. Lithosphere is composed of rocks and minerals.



Rocks:

Rocks are aggregates of minerals and do not have a chemical formation. They are formed naturally as an after-effect of volcano etc. Example of rocks are granite (igneous rock), quartz, calcite, limestone, slate and marble.

Minerals:

Minerals are naturally occurring substances with a specific composition and structures. They are formed by geological process. Examples include magnesium, zinc fluoride, iodine, chromium etc.

Q 6-

Answer:

Solution

(A)

The arithmetic mean of a set of numbers is calculated by dividing the sum of the numbers by the total count of the number

The formula is

$$\frac{9 + 8 + 10 + k + 12}{5} = 15$$

simplifying,

$$39 + k = 15 \times 5$$

$$39 + k = 75$$

$$k = 75 - 39$$

$$k = 36.$$

So, the value of k is 36.

(B)

Let,

The initial quantity of sugar solution = $4x$ liters

The initial quantity of coloured water = $3x$ liters

After adding 10L of coloured water,

new amount of coloured water = $3x + 10$

According to problem,

ratio 4:5:

$$\frac{4x}{3x + 10} = \frac{4}{5}$$

Cross multiplying

$$5 \cdot 4x = 4 \cdot (3x + 10)$$

$$20x = 12x + 40$$

$$20x - 12x = 40$$

$$8x = 40$$

$$x = 5$$

So,

the initial quantity of the sugar is

$$4x = 4 \times 5 = 20 \text{ l.}$$

The initial quantity of sugar solution is 20 litres.

(C)

Formula:

Volume of a sphere =

$$V = \frac{4}{3} \pi r^3$$

Given:

$$r = 12 \text{ cm}$$

To Find

Volume of a football = ?

Sol:

$$V = \frac{4}{3} \pi r^3 \quad \Rightarrow \quad V = \frac{4}{3} \pi (12)^3$$

$$V = \frac{4}{3} \pi \cdot 1728$$

$$V = 2304 \pi \approx 7238.23 \text{ cubic cm}$$

So,

the volume of the football is approximately

$$2304 \pi \approx 7238.23 \text{ cubic cm.}$$

(d)

Solution,

Observing the difference, it seems difference is increasing by a pattern.

$$1. \quad -8 - (-10) = 2.$$

$$2. \quad 6 - (-8) = 14$$

$$3. \quad 40 - 6 = 34$$

$$4. \quad 102 - 40 = 62.$$

So

$$62 + 28 = 90$$

adding the term in series

$$\text{thus, } 102 + 90 = 192.$$

The next term is 192.

Q No 8:**(a)**

Given, $n = 7$

Substitute n into the formula.

$$\text{Charge} = 20 + 4 \times 7$$

$$= 20 + 28 = 48$$

So, Brain would charge £ 48.

(b)

- (1) replica
- (2) humanity
- (3) search
- (4) nominate
- (5) fatter.

Date: _____

Day: M T W T F S

(C)

1. Find $A \cup B$

$$A \cup B = \{10, 11, 12, 13, 14, 15\}$$

2. Find $(A \cup B)'$

$$\begin{aligned} (A \cup B)' &= U - (A \cup B) \\ &= \{16, 18\} \quad \text{L.H.S} \end{aligned}$$

3. Find A'

$$\begin{aligned} A' &= U - A \\ &= \{14, 16, 18\} \end{aligned}$$

4. Find B'

$$\begin{aligned} B' &= U - B \\ &= \{11, 13, 15, 16, 18\} \end{aligned}$$

5. Find $A' \cap B'$

$$A' \cap B' = \{16, 18\} \quad \text{R.H.S}$$

So LHS = RHS

$$(A \cup B)' = A' \cap B'$$

(D)

The number of triangles in the figure is 8.