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## Section II

Q. No 6  
(a)

Answer:

$$K = ?$$

arithmetic mean of 9, 8, 10, K, 12 = 15

$$\text{arithmetic mean} = \frac{9+8+10+K+12}{5} = 15$$

$$= \cancel{5} \frac{9+8+10+K+12}{\cancel{5}} = 15 \times 5$$

$$= 39 + K = 75$$

$$K = 75 - 39$$

$$K = 36$$

Hence, K is equal to 36

Rechecks by filling the value of K in equation.

$$\frac{9+8+10+K+12}{5}$$

$$= \frac{39+36}{5}$$

$$= \frac{75}{5} = 15$$

Hence, proved that  $K = 36$

(b).

**Answers-**

Ratio of the mixture of  
sugar solution and  
colored water = 4 : 3

colored water added  
to mixture = 10 liters

Initial quantity of sugar in  
the given mixture.

The initial quantity of sugar  
remains the same i.e 4

(c).

**Volume of football = ?**

**Answer:**

Volume of football = ?

radius = 12cm

$$\frac{4}{3} \pi r^3 = \frac{4}{3} (3.14) (12)^3$$

(d).

Series:

-10, -8, 6, 40, 102, ?

Answer:

-10, -8, 6, 40, 102, 208

208 will come in place of question mark.

Q. NO. 8

(b).

(i)

ralciep

real

(ii)

tyhniaum

main

(iii)

moniteah

month

(iv)

taxeph

Answer: trap

(d).

Answer:

There are 24 triangles in the given figure.

(a)

Answer:

$$\text{Charge} = \$20 + 4n$$

$$\text{if } n = 7$$

$$\text{Charge} = \$20 + 4(7)$$

$$= \$20 + 28$$

$$= \$48$$

Brain would charge \$48, if a house has 7 windows.

(c).

Answer:

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

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

$$B = \{10, 12, 14\}$$

$$U = \{10, 11, 12, 13, 14, 15, 16, 18\}$$
$$A \cup B = \{10, 11, 12, 13, 14, 15\}$$
$$(A \cup B)' = \{16, 18\}$$

$$A' \cap B'$$

$$A' = \{14, 16, 18\}$$

$$B' = \{11, 13, 15, 16, 18\}$$

$$A' \cap B' = \{16, 18\}$$

Hence,  $(A \cup B)' = A' \cap B'$   
proved,

## Section - I

Q. No. 2.

(a).

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

1) Dengue:

Dengue was derived from the word 'Dizga' which means

evil spirit. Dengue is also known as break bone fever. It is a dreadful fever caused by <sup>biting of</sup> mosquito 'aedes aegypti'.

### 2) Causative agents of Dengue:

- (i) Poor sanitation system.
- (ii) Poor hygiene.
- (iii) Dearth of cleanliness.
- (iv) Poor waste management system.
- (v) Presence of excessive dirty water.
- (vi) Poor drainage system.

### 3) The symptoms of Dengue:

#### (a) Mild Dengue symptoms:

- (i) Headache.
- (ii) Mild fever.
- (iii) Fatigue muscles.
- (iv) Weakness in bones and body.
- (v) Nausea.

#### (b) Acute Dengue symptoms:

- (i) Severe headache.
- (ii) High fever.

(iii) Fatigue muscles

(iv) Nausea.

(v) Weakness in bones and body.

### (c). Chronic Dengue symptoms

(i) Prolonged fever.

(ii) Flu

(iii) Severe headach

(iv) Muscle fatigue and spasms

(v) Nausea

### (c).

Discuss structure and function of mitochondria.

How it is powerhouse?

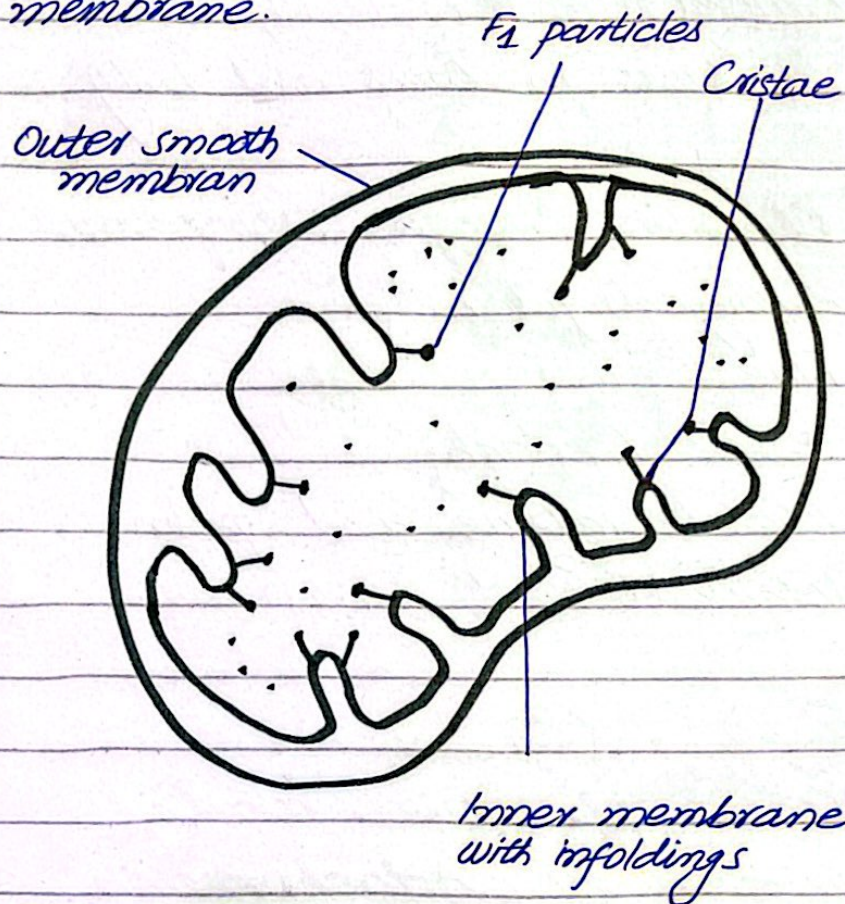
1) The structure and function of mitochondria:

(i) It is a double membrane structure

(ii). Its outer membrane is smooth while inner membrane has infoldings and contains knob like structure called *cr tae*.

(iii) These knob like structures contain

$F_1$  particles are suspended in its membrane.



**Figure: The structure of mitochondria**

**2) The function of mitochondria:**

- (i) It supplies energy to the cell.
- (ii) It provides mechanical support to the cell.
- (iii) It helps in transportation of materials from one part of



of the cell to the other.

iv). It stores energy in <sup>the</sup> form of ATP

v). It provides support in different cellular mechanisms.

### 3). How mitochondria is powerhouse?

i). Mitochondria is also known as the power house of the cell.

(ii) It is called power house because it stores energy in the form of ATP and provides energy to the cell.

(iii). Therefore, it is called the power house of the cell.

(d)

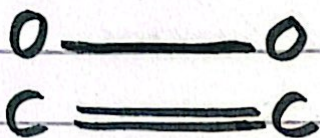
What are covalent bonds?

Explain types along with elaborating structures.

1) Covalent bonds:

These are

the bonds formed between atoms or elements due to partial or complete sharing of electrons.



2). The types of covalent bonds:

(i) Single covalent bond:

A bond which is formed by sharing of a single pair of electrons between atoms of an element.



Figure: Single covalent bond.

(ii) Double covalent bond:

It is formed by complete sharing or transfer of two pairs of electrons between

atoms of elements



Figure: Double covalent bond

(iii) Tripple covalent bond:

It is formed due to ~~tripples~~ sharing or complete transfer of tripple pair of electrons between atoms of element.



Figure: Tripple covalent bond

(b)

Explain dark matter and dark energy:

Dark matter:

It is the matter present under the surface of the earth which attracts every

thing down towards the earth  
Because of the gravitational pull.

2). **Dark energy:**

The energy produced  
by the dark matter which attracts  
every thing down towards the earth  
due to gravitational pull is  
called dark energy.

Q. No. 3.

(a).

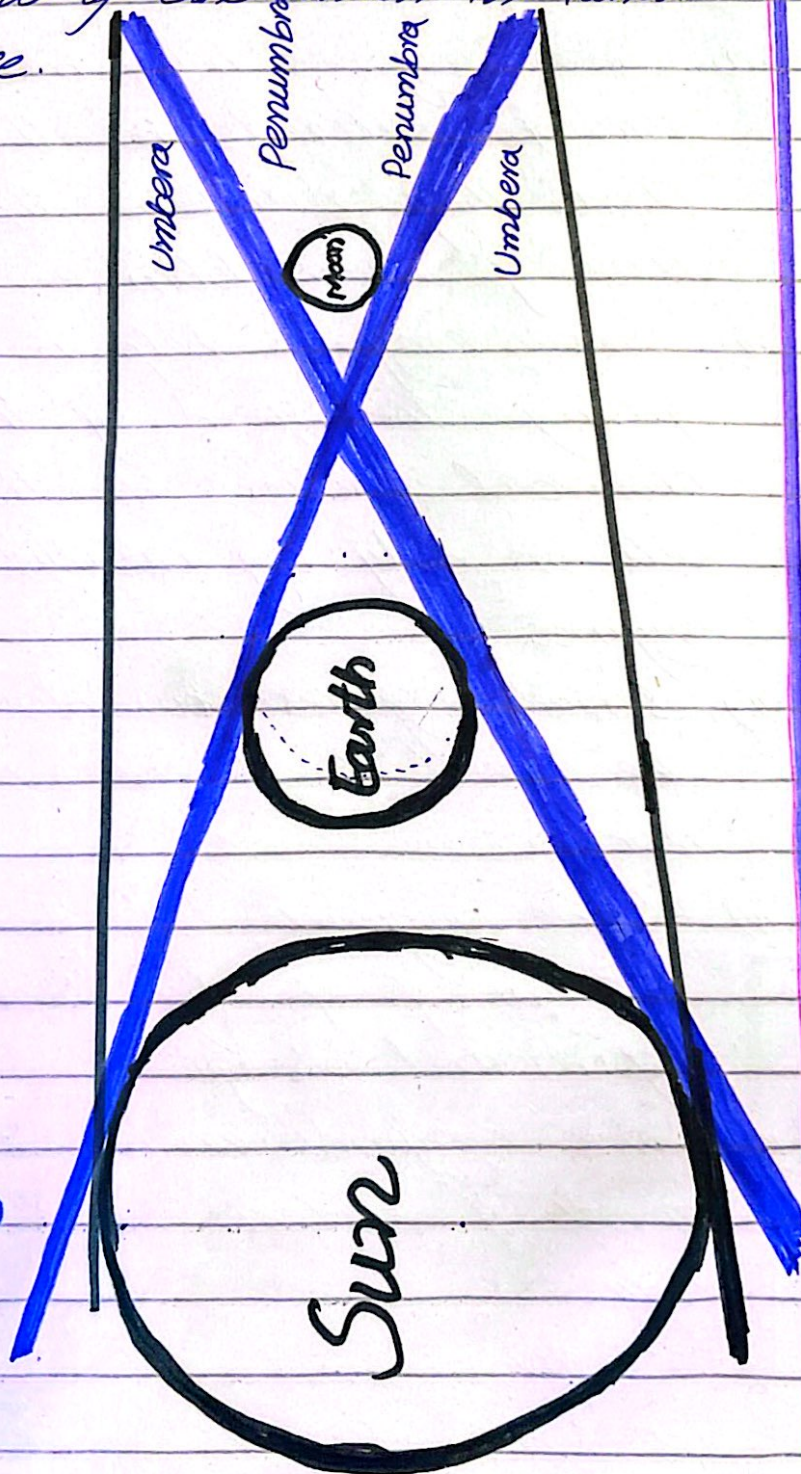
What is lunar eclipse?  
Explain in detail with  
opt diagrams.

1). **Lunar eclipse:**

A lunar  
eclipse occurs when the  
earth comes between the  
sun and the moon. It occurs

on new moon, but not on every new moon. The earth casts its shadow of the moon in lunar eclipse.

### Figure: Lunar Eclipse.



(b).

Explain function of enzyme in detail with examples.

2). The functions of enzymes:

(i) Some enzymes help in the flow of materials in the blood. They maintain the level of haemoglobin.

(ii). Some enzymes help in fastening the speed of the chemical reactions in the cell or body. e.g catalyst enzymes

(iii). Some enzymes slow down the speed of the chemical reactions.

(iv). Some enzymes help in the process of digestion e.g, pepsin and bile juice.

(v). Some enzymes exhibit the growth of bacteria in the body.

(vi). Mostly enzymes help in the catalytic activity of the cell.

(d).

Are earthquakes and volcanic eruptions interconnected? If yes, then how?

1) Earth quakes and volcanic eruptions are interconnected:

Yes, earth quakes and volcanic eruptions are interconnected.

2) How are earth quakes and volcanic eruptions interconnected?

2.1) Earth quakes:

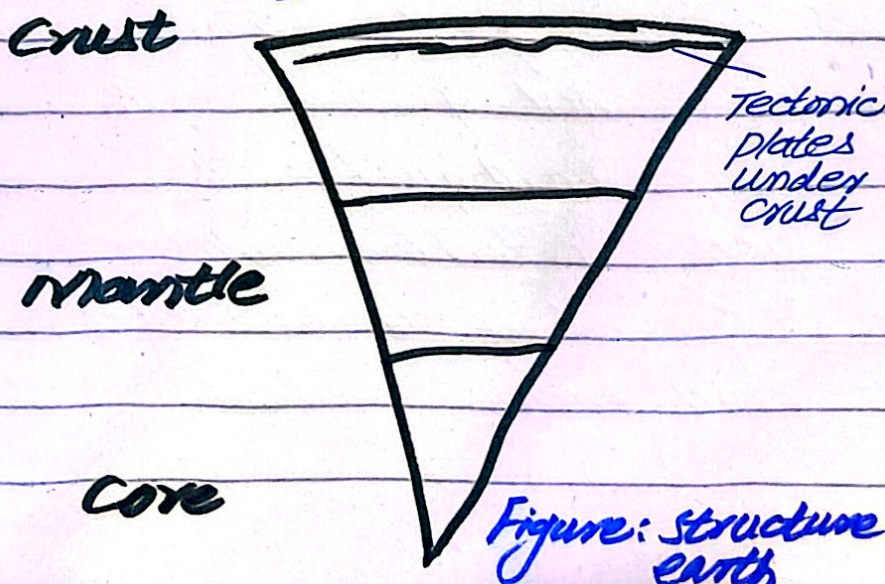
The movement of the tectonic plates because of the magma under the crust of the earth cause earthquakes. The sliding of tectonic plates over a period of time leads to earth quakes.

## 2.2). Volcanic eruptions:

The magma under the crust of the earth erupts out in the form of volcanic eruptions due to the sliding of tectonic plates is called volcanic eruption.

## 2.3). Earthquakes and volcanic eruptions are interconnected:

Without the sliding of tectonic plate earthquakes do not occur and the magma or volcanic eruption cannot come out of the crust of the earth.





(C).

Give a brief account for electromagnetic radiations.

What is EMR spectrum.

1) **Electromagnetic radiation:**

Electromagnetic radiations are used for the detection of any particle, <sup>its</sup> volume and its location. These radiations are used in different medical instruments.

2) **EMR spectrum:**

- (i) It is used for medical instruments.
  - (ii) It reflects the electromagnetic radiations.
  - (iii) It is used in detection and for military purposes.
  - (iv) It helps in locating enemy.
  - (v) It helps in medical treatments.
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