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Batch : 198

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General Science  
Er Ability :-

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Section - II  
Ability

Question # 6:-

a-

Solution:

As we know that  
Mean =  $\frac{\text{Sum of all observations}}{\text{Total no. of observations}}$   
So from given statement

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

$$15 \times 5 = 9 + 8 + 10 + K + 12$$

$$75 = 39 + K$$

$$K = 75 - 39$$

$$\boxed{K = 36} \text{ Answer}$$

b-

Solution

Date: \_\_\_\_\_

From given statement

C-

As we know that

$$\text{Volume of sphere} = \frac{4}{3} \pi r^3$$

$$= \frac{4}{3} \times 3.14 \times (12\text{cm})^3$$

$$= \frac{4}{3} \times 3.14 \times 1728 \text{ cm}^3$$

$$= \frac{4}{3} \times \frac{314}{100} \times 1728$$

$$= \frac{50}{25}$$

$$= \frac{12258.5 \text{ cm}^3}{25}$$

$$= \boxed{7234.5} \text{ Ans.}$$

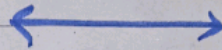
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d-

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

So according to given statement answer will be 104



### Question # 8

a-

According to formula given in statement

$$\text{Charge} = \text{£}20 + 4n$$

$n$  = no. of windows.

No. of windows in house =  $n = 7$   
Then,

$$\text{Charge} = \text{£}20 + 4(7)$$

$$= 20 + 28$$

$$= \text{£}48 \text{ Answer}$$

b-

(i) ralciep  
replica

(ii) tyhniaum  
humanity

(iii) arsehcc

(iv) moniteah

(v) tareph

c.

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

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

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

$$U = \{10, 11, 12, 13, 14, 15, 16, 18\}$$

L.H.S =  
 $(A \cup B)'$

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

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

$$U - A \cup B = (A \cup B)'$$

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

$$\text{L.H.S} = \boxed{\{14, 16, 18\}}$$

$$\text{R.H.S} = A' \cap B'$$

$$A' = U - A$$

$$= \{10, 11, 12, 13, 14, 15, 16, 18\} - \{10, 11, 12, 13, 15\}$$

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

$$B' = U - B$$

$$= \{10, 11, 12, 13, 14, 15, 16, 18\} - \{10, 12, 14\}$$

$$= \{ \}$$

3

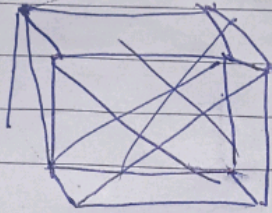
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 $A' \cap B' = \{14, 16, 18\} \cap \{ \}$

R.H.S =  $\boxed{\{14, 16, 18\}}$

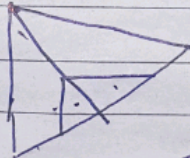
Hence proved

L.H.S = R.H.S

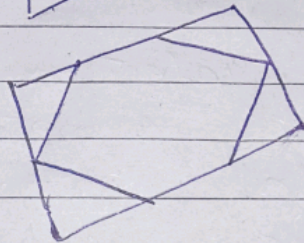
d.



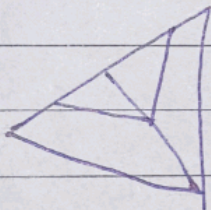
= 4



= ~~4~~ 5



= 4



= ~~4~~ 5

Total Triangles =  $\boxed{18}$  Answers



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# Section I :- General Science:

## Question # 2:-

a-

What is dengue?

Dengue is a viral infection caused by an infectious agent <sup>through female</sup> ~~known~~ mosquito <sup>known</sup> as "Aedes Aegypti". This virus cannot attack on its own thus requires a mediator which is a mosquito. This infection causes profound symptoms and even cause death. The female mosquito when bites an infected person the virus enters its stomach and takes 10-12 days to complete its cycle. Once the cycle is completed this virus is transmitted to other person to whom the female mosquito bites.

b.  
5

Once entered the person, the virus enters into lymph nodes and from there it enters the cells attaching to the golgi apparatus and starts to replicate itself. Some of the virus is taken up by phagocytes through the process called phagocytosis but if the infection is severe and virus is strong then alone phagocytes cannot kill all virus. This activation of immune system leads to the symptoms that are caused. Dengue virus is an dangerous virus and if not managed properly can also cause death. Hence it should be managed properly.

### Causative Agent.

The causative agent which results in dengue infection is Flaviviridae genus virus which is carried by a vector primarily female mosquito called Aedes Aegypti

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## Symptoms of Dengue virus:

Following are the symptoms of dengue virus.

1. Fever caused by activation of immune system
2. Weakness
3. Pain in joints
4. Painful muscles
5. Dehydration.



Q-

## C- Structure of Mitochondria.

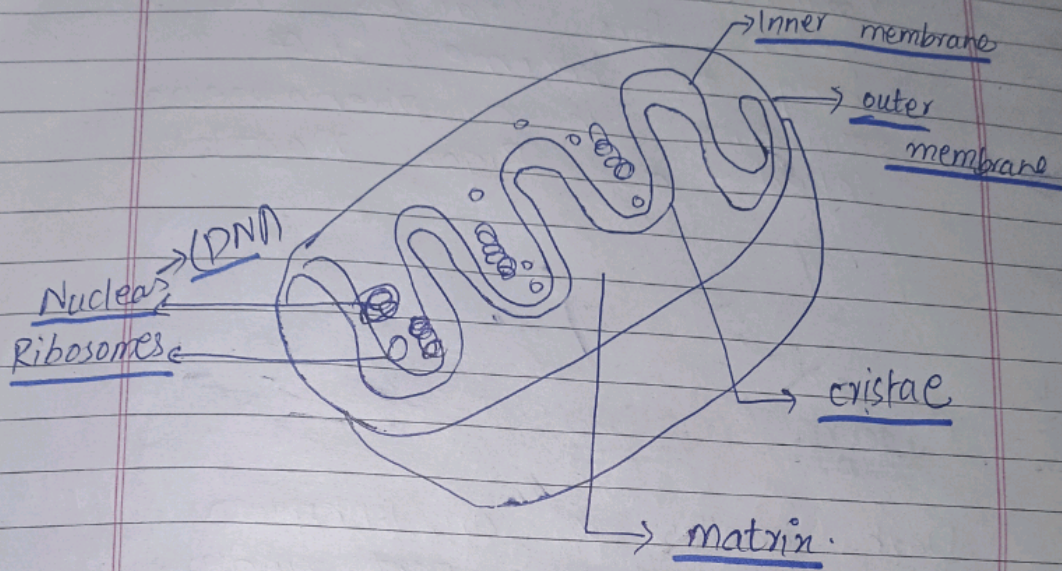
Mitochondria is an organelle present in cells. This act as powerhouse of cell.

It has two membranes thus a double membranous structure. It has an outer covering called outer membrane and inner covering called as inner membrane. The inner membrane is folded into projections called as cristae. There is fluid present between the membranes called as matrix.

There is nucleus present in mitochondria and ribosomes.



There are also proteins attached as  $F_0$  &  $F_1$ .



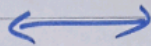
## Function of mitochondria:

Mitochondria act as "power house of cell". It means all the energy is generated from this organelle. All the function of entire human body requires ATP stands for adenosine Triphosphate. This ATP is produced by mitochondria. There is no life without this energy production. When a person dies this production of ATP stops.

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resulting in the contraction of muscles and the muscles are unable to relax. This causes the body to become stiff resulting in a phenomena called as "Rigor Mortis."



b.

### Dark matter:-

Dark matter is an unknown term which is not understood yet completely. This comprises of 27% of all the energy in universe. Scientists are unable to understand it completely. But its presence is completely justified as except stars and planets the rest of all the energy is either dark matter or dark energy.

### Dark Energy:-

27% of energy in universe is dark matter while 68% of

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energy is dark energy the rest 5% is planets, stars and galaxies. Dark energy is dark due to the fact that it does not emit  $\gamma$  (gamma) radiation like other stars and planets thus it is completely dark and has zero light.



#### d. Covalent bonds:

Covalent bond is defined as a type of bond formed by the sharing of valence electrons. Everything in this entire universe wants stability. In the same way, atoms also want stability by either having two or eight electrons in the valence shell following duplet & octet rule and becoming stable or noble. When atoms have extra numbers of electrons they form bonds with other atoms by sharing of electrons. This sharing of electrons

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is results in bond which is called as covalent bond.

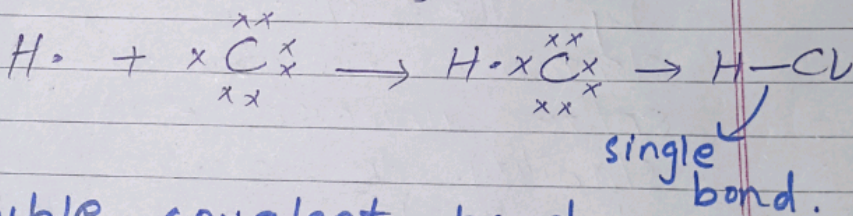
## Types of covalent bond:

### 1- Single covalent bond:

This type of bond is formed when two atoms share only one pair of electron.

#### Example:-

For example HCl  
In HCl H has 1 valence  $e^-$  while chlorine has seven  
so they both share electrons to develop stability

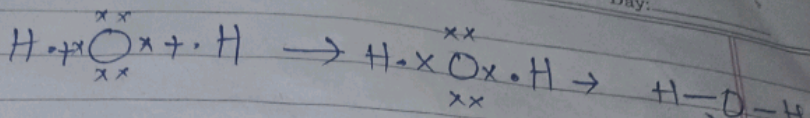


### 2- Double covalent bond:

This type of bond is formed by sharing two pairs of electrons

#### Example:-

For example  $H_2O$   
The two H atoms have two valence electrons collectively and one oxygen atom has six valence electron thus forming double covalent bond

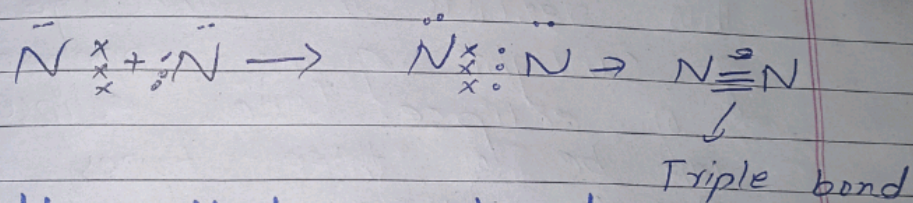


### 3- Triple covalent bond.

This type of bond is formed by sharing of three pairs of electrons.

Example:-

For example  $N_2$ .  
Each Nitrogen atom has 5 valence electrons



### 4- Hyp Hydrogen bond:-

It is the type of covalent bond in which hydrogen bonds with other atoms e-g  $H_2O$

### 5. Polar bond.

This is the type of bond which there is unequal distribution of charges and the bond is somewhere between ionic and polar covalent.

Example of polar bond is water.

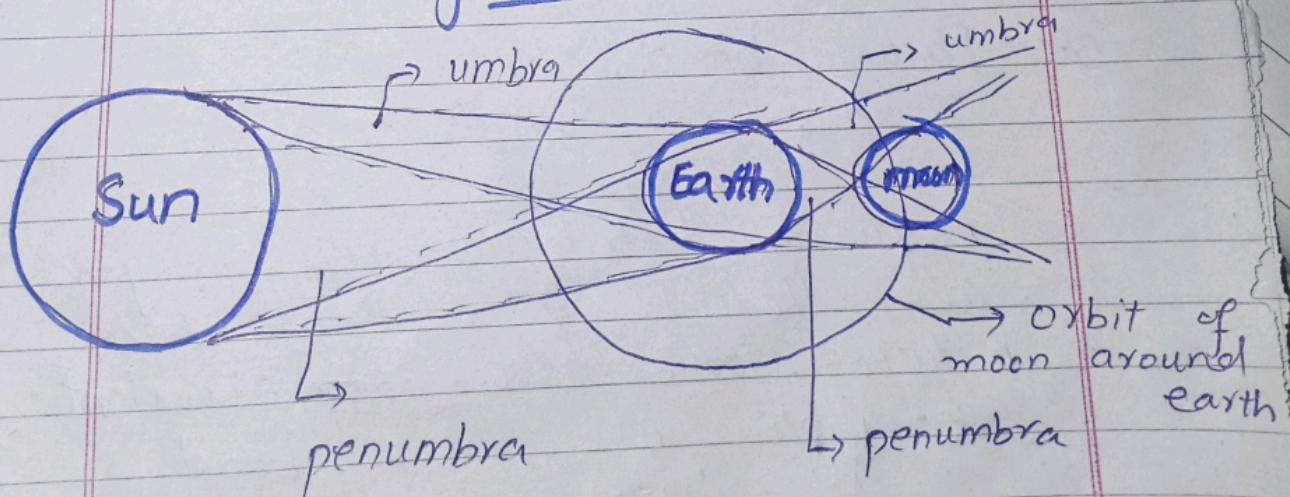
## Question # 3:-

### a. Lunar Eclipse

Lunar eclipse is defined as a phenomena when one celestial body called as earth comes in between other two celestial bodies called as sun and moon. This results in blockage of sunlight giving appearance of eclipse. Lunar eclipse can be of three types i.e

- 1- Partial eclipse
- 2- Umbral eclipse
- 3- Total eclipse.

### Diagram



When this moon goes behind shadow of earth or earth when revolving around sun comes between sun and moon lunar eclipse occurs. Lunar eclipse always occur during full moon phase.

Types are given below:-

1- Partial eclipse:-

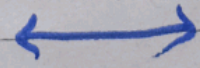
This type of eclipse occurs when a part of earth covers the moon resulting in partial eclipse. (It occurs many times and is barely noticeable.) It causes the moon to become red.

2- Umbral eclipse / Total eclipse

This type of eclipse occurs when entire earth covers the sun and no light passes through it. (This is most dangerous and should not be seen with naked eye)

3- Penumbral eclipse. This eclipse can be seen without aid.

This occurs when moon passes through earth's penumbral shadow. This eclipse is barely noticeable.



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## b- Functions of enzymes:-

There are many enzymes in the body that play a pivot role in body. The main function of enzyme is to act as a catalyst and speed up the metabolic processes.

There are six categories of enzymes which are given below

### 1- Oxidoreductases :-

These enzymes help in oxidation-reduction reactions and speed them up.

### 2- Hydrolases :-

These enzymes help to increase hydrolysis of molecules.

### 3- Lyases :-

These enzymes help to break down substances in body.

### 4- Transferases :-

These enzymes act as transfer agent & are involved in transposition.

### 5- Isomerases :-

These enzymes help in the process of isomerization.

### 6- Ligases :-

These enzymes help to join two molecules together.



## Electromagnetic Radiations:

These are the type of radiations that have both spectrum of eel electric and magnetic. These radiations requires a medium to travel through i.e they cannot have travel through space. Different types of radiations have different wavelengths and penetrating power.

Similarly different types have different functions also.

### Types of electromagnetic waves:-

- 1- Radio waves
- 2- Microwaves
- 3- X-rays.
- 4- Infrared radiations
- 5- Visible light
- 6- Ultraviolet radiations

### Electromagnetic spectrum.

Electromagnetic spectrum is defined as a spectrum which shows frequency and wavelengths of each radiations

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d.

yes earth quakes and volcanic eruptions are interconnected. Earth quakes are caused by the movements of tectonic plates. These movements

causes the earth to shake resulting in earthquakes.

Sometime an earthquake can cause volcanic eruption

As the movement of tectonic plates below a volcano can disturb the

magma inside the volcano. This disturbance causes the magma to explode out resulting in volcanic eruption.

This movement of tectonic plate can either be oceanic oceanic tectonic plate or oceanic continental plate.