

D: 2

Q) What is dengue?

Dengue is a disease spread by mosquitoes causing abnormally low platelets, fever, joint pain and lethargy.

1) Causative agent of dengue:

Dengue is caused by being bitten by *Aedes Aegypti* mosquito.

2) Symptoms:

- 1) Joint pain
- 2) Bleeding
- 3) Low platelets
- 4) High grade fever.

⇒ Dark matter and dark energy:

Dark matter and dark energy are almost related topics pertaining to universe.

Dark matter is the unseen matter that holds immense mass of universe intact. It is almost 27% of universe. This is the same mass that exerts immense force to hold the stars in a universe.

⇒ Dark energy:

Dark energy is opposite to dark mass. It is the energy which causes expansion of universe and moves stars away from their path.

c) Structure and function of Mitochondria.

- 1) Outer membrane: Works as a barrier and facilitates transport of substances inside and out.
- 2) Inner membrane: It is a folded membrane having structures called cristae which increases surface area and house the enzyme necessary for the production of ATP. Folds enable larger area for chemical reactions.
- 3) Intermembrane space membrane: It is the space between outer and inner membrane containing hydrogen gradient for phosphorylation of ATP.
- 4) Matrix: The innermost part of mitochondria with ribosomes and DNA embedded. It helps in actual chemical process of energy generation.

- How it is a power house:

It is power house because chemical reaction to breakdown food is started in cell cytoplasm and the product is taken to mitochondria with ATP is formed. Adenosine triphosphate (ATP) is a chemical base which when breaks down supplies energy of functioning of body.

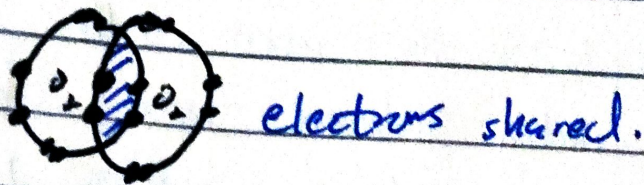
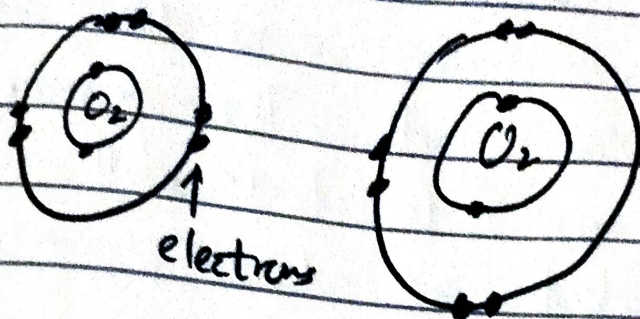
Q) What are covalent bonds

Covalent bonds are bonds made by sharing of electrons. They are weak in nature and easily broken down and mostly formed between ~~some~~ non-metals to complete their octet (8) configuration for stability.

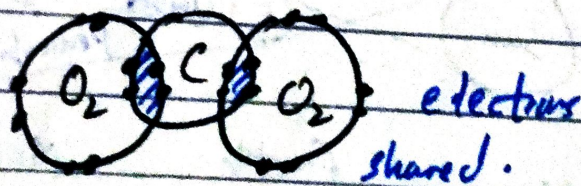
- Types of covalent bonds:

2) Atoms of the same element:

Bonds formed between atoms of the same element such as O_2 .



2) Atoms of different elements:

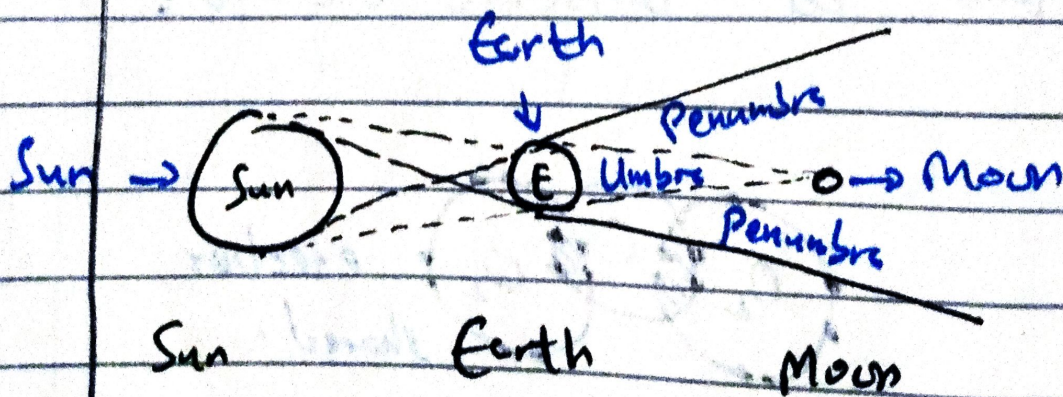


4 valence electrons of carbon shared by 2 + 2 valence electrons of oxygen to complete its octet. Oxygen also complete its octet by two.

Q No 3 What is lunar eclipse?

Lunar eclipse is a phenomenon when moon reaches at a point when it is not between earth and sun and sun rays are ~~not~~ unobstructed while reaching on earth. This phenomenon turns moon to look dull or reddish in colour.

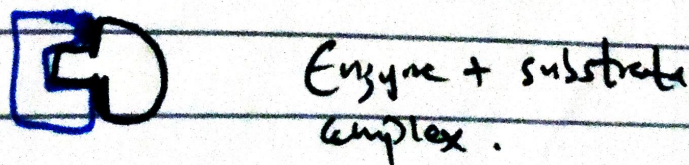
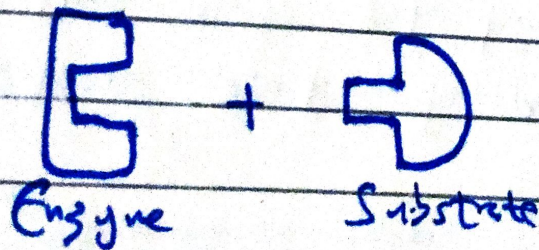
Complete ~~Partial~~ lunar eclipse occurs if the moon falls at umbra whereas moon when falls beside umbra, i.e., in the penumbral region.



b) Enzymes:

Functions of enzymes:

Enzymes are biological catalysts, which help up to speed up the chemical reactions by decreasing the activation energy of reactions. They are proteins in nature and are not consumed in reactions. Enzymes work by 'lock and key' hypothesis when a particular substrate fits with the active site of enzyme and not any other substrate can fit there.



Lock and Key hypothesis.

Enzymes function in:

1) Digestion:

- a) Amylase in mouth - digests carbs.
- b) Protease in stomach - digests proteins
- c) Lipase in intestines - emulsifies fats

2) Industry:

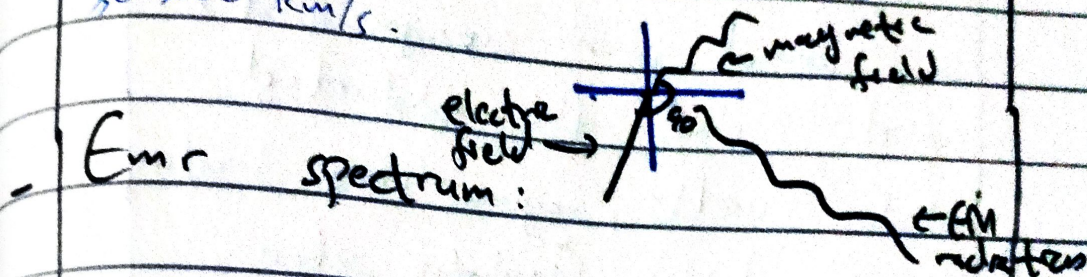
- a) Protease and lipase in detergent industry.
- b) Used in cheese and curd making

3) Medical technology:

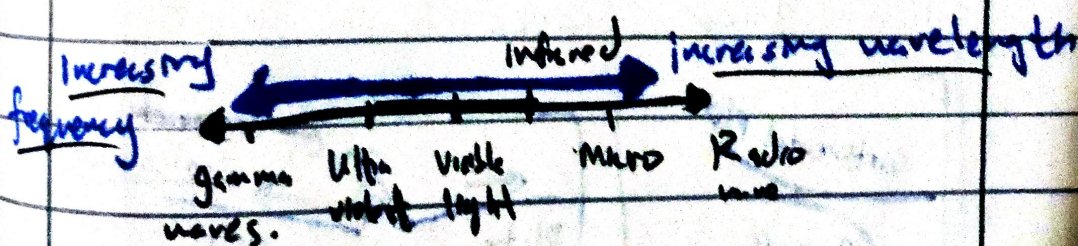
- a) Used in recombinant DNA technique.
- b) Restrictive enzyme used in biotechnology to open bacteriophages and modify their plasmid rings.

1) Electromagnetic Radiations:

They are radiations formed when electric and magnetic field travel perpendicular, i.e., at 90° to each other. These waves are oscillations travelling through space with speed of light which is 300000 km/s .



This is a spectrum of EM waves based on their frequency and wavelength. As frequency is inversely proportional to wavelength, the waves with most frequency have shortest wavelength.



d) Earthquakes and volcano eruptions are inter-connected

Yes, they both are interconnected as both arise from same tectonic activity. Earthquakes happen when tectonic plates slide against or away from each other. Similarly, volcanoes are formed when convergent plates collide and the subducted plate melts, magma rises leading to eruptions. Similarly, when divergent plates move apart, magma from the mantle rises up forming eruptions. Therefore, both are interconnected as when there are more volcanoes, there are more chances of earthquakes in those areas.

