

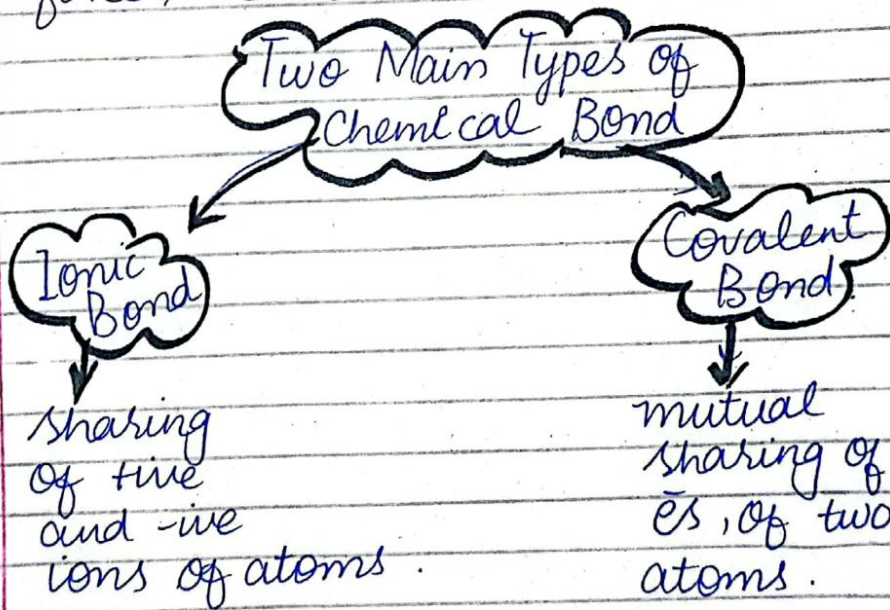
General Science Ability Paper

Section-II

Question - 3.

(a). Reason of Formation of Chemical bond.

Atoms are in an unstable form due to half-filled valence shell. Therefore, to attain stability, and to filled their outer most shell, atoms combine together through an attractive force, called chemical bond.



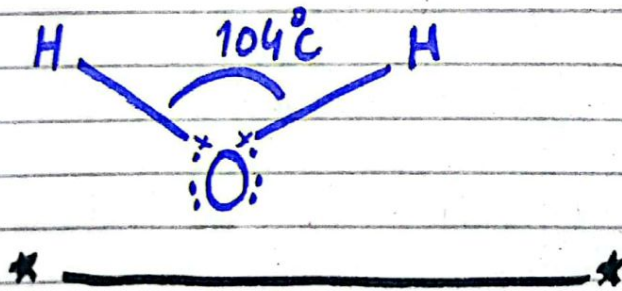
Covalent bond in water molecule.

“The type of chemical bond formed by mutual sharing of electrons of two same or different atoms, is called covalent bond”

Water - an example of polar covalent bond.

In the molecule of water (H_2O), the two hydrogen atoms are not evenly distributed around the oxygen atom.

The unequal sharing of electrons between atoms and the unsymmetrical shape of molecules, show the polarity of water. As, H_2O has two poles - a positive charge on hydrogen atom and a negative charge on oxygen atom. It indicates that water molecule is an electrically polar, having 104.3° angle.



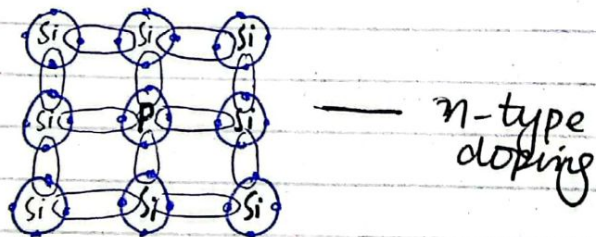
3(b) Doping.

Doping is basically the addition of small impurities in a semi-conductor to increase its conductivity.

There are two ways through which doping occurs.

(i) n-type doping.

This type of doping occurs in atoms have 5-electrons in a valence shell. For example, phosphorous atom. Four electrons combine with silicon atom while, the fifth one is freely moved serve as charge carrier. This free electron require less energy from to be lifted from valence band to the conduction band.

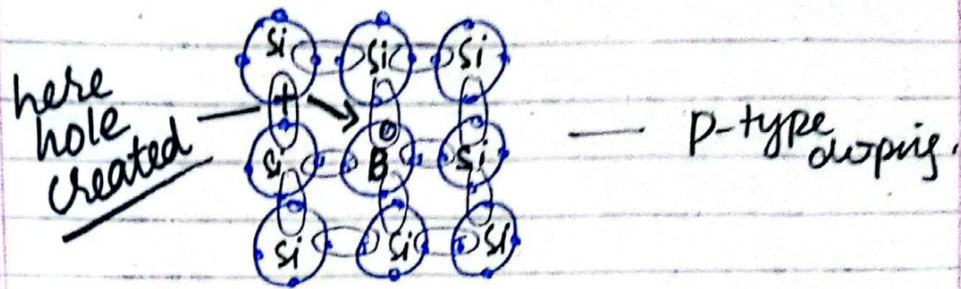


(ii). p-type doping.

Contrary to n-type, here 3-valent dopant effect can catch an additional outer electron, thus leaving a hole in valence band of silicon atoms. Therefore, electron in valence band become mobile the holes move in opposite direction to electrons movement.

Here 1.1 eV energy is needed to raise a valence electron of

Silicon to conduction band



Different Types of Ceramics.

There are various classification of ceramics from traditional to advance level.

(i) Classification on the basis of composition.

Ceramics here classified into three distinct categories:

(a) Oxides:

These are made from metal oxides and non-metallics, It includes, aluminium, zirconia, iron oxides etc.

(b) Carbides:

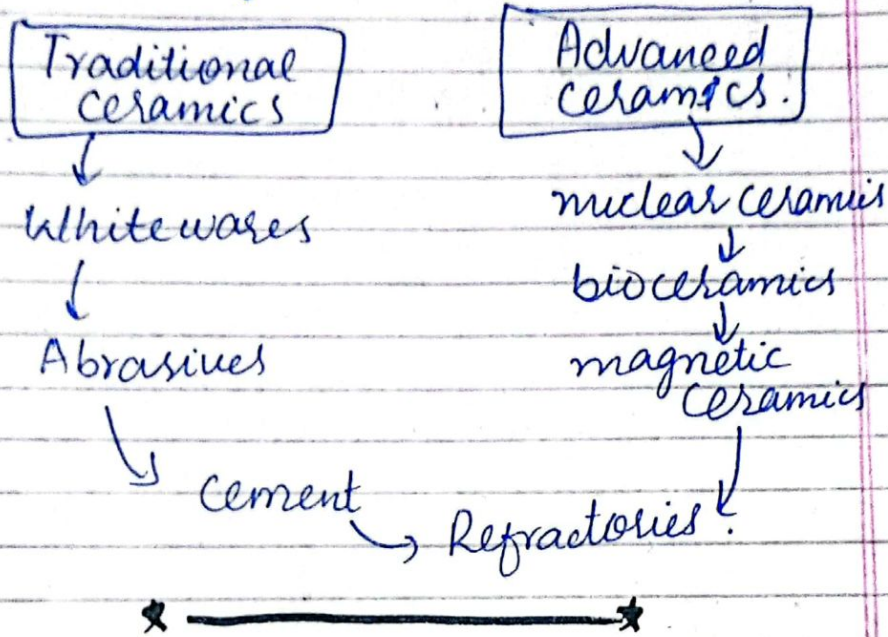
These are made from carbon and usually used in industrial abrasives and cutting tools. Borides, nitrides and silicide are also included in this category.

(c) Composites:

These are the combination of both oxides and non-oxides materials. These include, fiber reinforced polymers (FRP),

and ceramic matrix composites (CMC) etc.

(ii) **Classification on the basis of material.**



3. (c).

Merits of global warming

(i) **Increased Food production.**

Warm environment is suitable for better plant growth. Thus, it can increase agricultural productivity, and boost economy.

Demerits of global warming

Raising sea level.

Polar ice caps, and sea level rise to cause floods, that displacing millions of people, and damages sea-organisms.

(ii) **New trade routes and resources.**

Melting of ice can open new sea-routes, and getting access of natural resources like, oil, gas etc.

Increase water scarcity.

Changes in evaporation method and participation process due to 'warm environment led to scarcity of water and increase droughts.

(iii) **Increase human development.**

Due to risks of high temperature people start moving towards better places, that are really ~~be~~ useful for their success and development

Loss of biodiversity.

High temperature rise can lead to extinction of many plants and animals species.

(iv) **Increases economic opportunities**

through movement to other cities where tourism increases, and increases their GDP

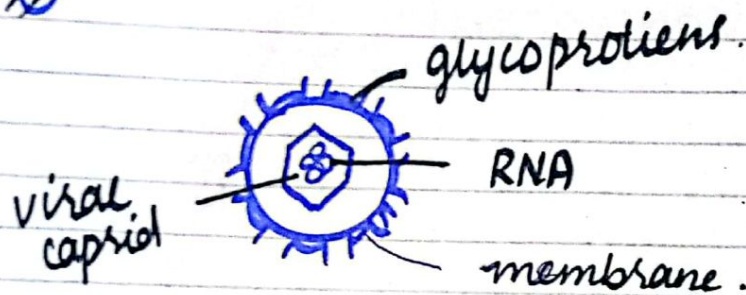
Destroy human health.

Heat shocks make people ill and increases their stress. High temperature spread various diseases

3 (d). **Polio**

Polio is a highly infectious diseases that can

also be called as polio myelitis, caused by poliovirus. this virus spreads from person to person through direct contact and causes paralysis. Polio has not any permanent treatment, while it can be prevented through some safety measures.



Structure of Poliovirus

Challenges faced in eradication of virus in Pakistan.

Following are the challenges in Pakistan to remove polio permanently:

(i) Risk of Insecurity.

There are several regions i.e, northwestern parts, where healthworkers are being targetted.

(ii). Misconception regarding Vaccines.

People have misunderstanding

about polio-vaccines. They think that it is harmful for their children, leads to failure of removing polio.

(iii) Limited facilities to health ~~care~~ workers.

Its removal require the facilities of health care centres because, in remote areas, there are difficulties, faced by health workers.

(iv) Limited Resources and Funding.

As a developing country, providing access to all of the required resources, is merely a challenge because for this purpose, more funds are required and Pakistan can't afford it.

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Question - 4

(a) Liver juice "Bile"

Bile is a yellowish fluid or secretion that is produced in the liver and passed to gall-bladder for ~~the~~ storage or for transportation into the duodenum — the part of small intestine.

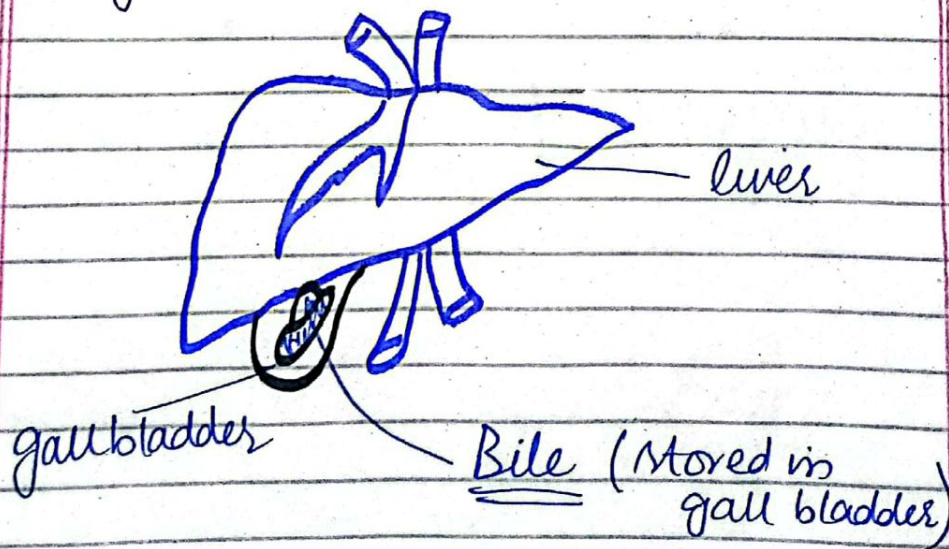
Function of Bile.

Bile helps in digestion of fats in duodenum. It breaks down the fats into fatty acids, which can be taken into body by the digestive tract.

Composition of Bile.

Bile is composed of acids, salts, phospholipids, cholesterol, pigments and electrolyte chemicals.

Bile is continuously secreted from liver cells into bile duct and gall bladder. It has pH value of about 7-8. Around 800-1000 ml of biles are produced daily by liver.

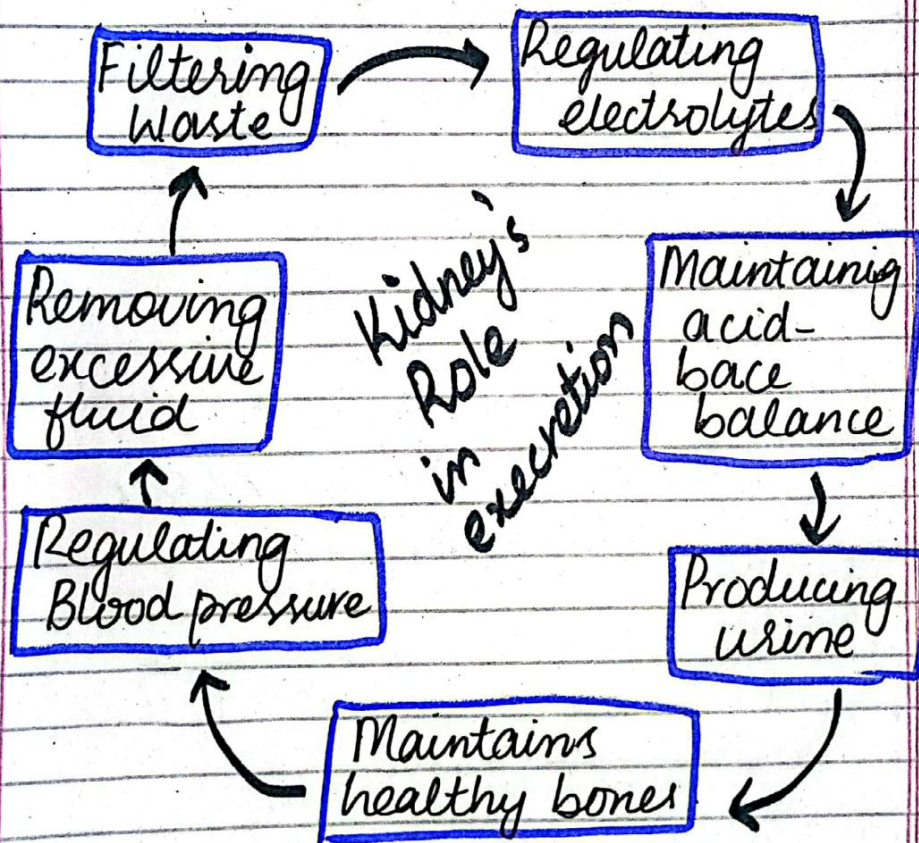


4(b).

Role of Kidney in excretion.

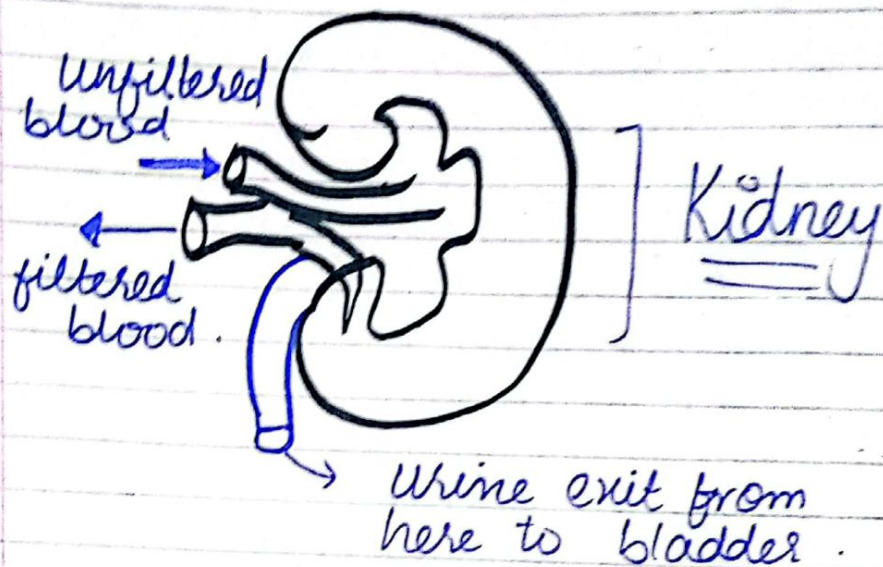
The kidney has a crucial role in excretion - the process of removing waste materials from the body.

Kidney plays a significant role in this case, which are as follows:



Kidneys filter the blood to remove waste products such as urea, creatine, and other toxins to maintain body's electrolytes. They help to maintain acid-base regulation by

exerting excessive H^+ ions
By controlling hormones
that help in constriction
or dilation of blood
vessels, it also regulate
blood pressure in body.



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4(c) Methods of Solid Waste Management.

Following are some methods of solid waste management.

(i) Biogas generation

An environmental, solid friendly solid waste disposal involves decomposition of organic waste in an anaerobic environment.

(ii) Waste-to-Energy Method.

This include turning solid waste into energy by means of anaerobic digestion.

(iii) Incineration.

Incineration or combustion involves the controlled burning of solid waste at high temperature.

(iv) Recycling.

It involves seperating processing and reusing material in solid waste.

4(d) Definations of some terms

(i) Anaemia.

the blood disorder, in which number of red blood cells are lower than normal concentration. It is due to lack of haemoglobin.

(ii) Appendicitis.

The inflammation of appendix, a small finger like pouch, attached to large intestine. When appendix ruptare it can lead to serious complications.

(iii) Spleen: It is an organ,

responsible for various diseases that can

located in the upper left region of abdomen, just below the diaphragm. It plays a vital role in blood filtering.

(iv) Myopia.

It is the near-sightedness defect of eye, in which nearer objects appear clearly, while the distant objects appear blurry due to shape of cornea or lens of eye.

(v) Isotones.

The atoms of different elements having same number of neutrons in atomic nuclei but different proton numbers.

