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Q2 a) Man has relied on drugs to cure ailments and to prevent them but given the side effects that these drugs have on the body scientists are working to find alternatives for the disease prevention and cure. Nutrition is one of the most effective ways to naturally boost the body's fighting ability with the diseases. A balanced nutrition has no side effects on the body.

Most of the diseases occur either because of lack of any nutrient or because of the inability of the body to fight against pathogen.

Among the diseases caused by nutrient deficiency scurvy is an important disease caused by lack of Vitamin C.

Similarly deficiency of this vital vitamin can expose the body more to cold and flu because it is an essential nutrient to boost the immunity.

Night blindness is caused by lack of Vitamin A, eating sufficient amount of this vitamin can prevent night blindness.

Vitamin K is necessary for blood clotting, a person with this deficiency cannot heal easily from cuts and abrasions.

All these vitamins can be found in food and fruits. Their daily intake can ensure prevention and cure from these diseases.

Moreover, certain foods are good source of chemically active substances essential for metabolism and immunity.

Alliin and zinc in garlic is a natural antibiotic to ward off the bad bacteria. Probiotics in the yougurt, kemchi and pickles promote of good gut bacteria for the microbial antagonism. Lastly, the growing cancer rates can be prevented with foods high in anticancer compounds.

(b) Composting:	Incineration	Pyrolysis
<p>(i) It is the best decomposition method used for the organic waste. After decomposition of such waste compost is formed which can be used as fertilizer of soil. Composting is an environment friendly method of solid waste management. Composting requires bacteria, fungi (decomposers) for the process. Moisture and suitable temperature is also a prerequisite for this process.</p>	<p>The process of burning of the solid waste, mostly of inorganic/^{organic} nature that can be infectious or cannot decompose is incineration. This is carried out in incinerators high temperature ovens. This burning creates fumes and ashes. Environmentally it is not efficient, but it is safest way of disposal of solid waste of infectious nature from hospitals, research laboratories etc.</p>	<p>The combustion of organic waste in the absence of oxygen is called pyrolysis. The term pyrolysis comes from pyro meaning fire and lysis meaning break down. It produces tar as a end product. It is safer than incineration. Tar can be used in road construction etc.</p>

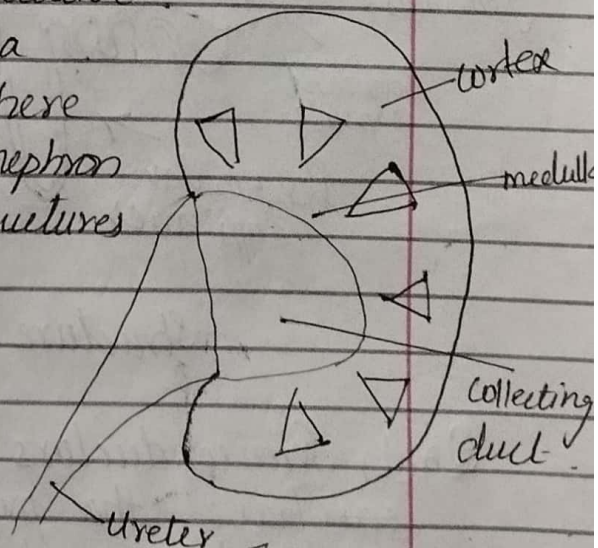
c) Role of kidney in Urine formation:

The break down of lipids and carbohydrates yield CO_2 and water where as which the body can easily get rid of through respiration. The proteins on their break down produces ammonia, a highly toxic compound which can lead to comma if not get excreted from the body. Ammonia is converted into Urea a less toxic compound by the liver cells. This urea is dissolved in blood. Kidney performs the filtration of blood and filters the urea, with Urea salts, water, pigments and end products of drugs are also filtered out by the kidney. Thus maintaining the homeostasis and osmoregulation of the body.

This role of kidney is ~~clarified~~ described by its structure.

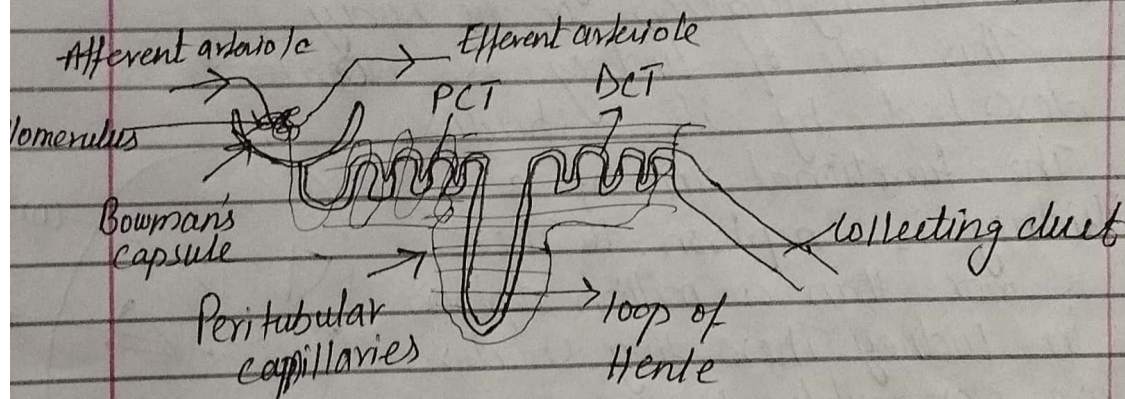
The functional unit of a kidney is nephron. There is more than a million nephron in kidney. These tiny structures are responsible for urine formation.

A nephron comprises of glomerulus surrounded by Bowman's capsule which emerges into proximal convoluted tubule which extends to form loop of Henle. which ultimately forms the distal convoluted tubule emptying into collecting duct. The afferent arteriole brings blood, converges into glomerulus, filtrate oozes from the single called



Transverse cross section of kidney

walls of glomerulus into bowmans capsule. Then afferent this arteriole surrounds the other parts of nephron as peritubular capillaries and then converges back out as efferent arteriole. The filtrate with salts and urea travels to proximal convoluted tubule, loop of henle and distal convoluted tubule where reabsorption of salts and water happens then is downpoured into collecting duct where it is urine. From the collecting duct the urine travels to the urinary bladder leaving the kidney through ureters. This process is solely done by the two kidneys. So urine formation occurs in the kidneys.



Structure of a nephron.

Q2) Semiconductors are the materials that can have the properties of both the conductors and insulators. Semiconductors are of intrinsic and extrinsic types. The pure form of semiconductors are intrinsic where as doped semiconductors (added impurity) are the extrinsic type of semiconductors.

It is being said that ^{our educational quality is way} western countries
Q2 d) The N type and the P type semiconductors are the two types of semiconductors of doped nature.

The N type semiconductors are doped with the elements of 5th group of periodic table and are mostly silicon and germanium mixed with phosphorus. This type of semiconductor conducts electricity because of the free electrons of fifth group.

The P type semiconductors are doped with the elements of the 3rd group of periodic table and are mostly silicon and germanium doped with Aluminium. This type of semiconductors conduct electricity because of the holes, a deficiency of electrons.

Semiconductors are the brain of modern electronics because in the field of electronics a controlled current is required to carry out the function. Without them electronic gadgets can't perform their work. These chips are what the electronics work upon. Semiconductors ~~can~~ work in a way that only a certain amount of current can pass through it unlike metals which pass all the current and unlike the ~~conductors~~ insulators which allow no current to pass through them.

Q3 a) Cyclone :-

A cyclone is a large scale weather system characterized by low pressure centers and rotating winds. Cyclones can

form on both land and ocean. But they are mostly ~~also~~ associated with tropical and subtropical regions. The specific causes of cyclone ~~varies~~ formation can vary depending on the type of cyclone but the most well known cyclones are tropical cyclones which include hurricanes in the Atlantic and North East Pacific, typhoons in the North West Pacific and cyclones in the South Pacific and Indian Ocean. The cyclones form because of

- (i) Warm ocean water which acts as source of heat
- (ii) Moisture in the air is an essential factor for the development of cyclone. The warm water ~~is~~ moist air rises and condenses as it cools at higher altitudes releasing its energy which fuels the storm.
- (iii) Low pressure systems is also a factor for cyclone formation.