QUESTION - 02

ANSWER:-

DEFINITION OF RADIOACTIVITY:- Due to nuclear instability, an atom exhibits a pheromeron called radioactivity. So it is defined as "Radioactivity is the pheromeron in which an unstable nuclei of certain elements emit electromagnetic radiations: alpha, beta and gamma rays, in its process to attain a stable condition.

Units of Radioactivity:- The units of radiooctivity are Curie and Rutherford

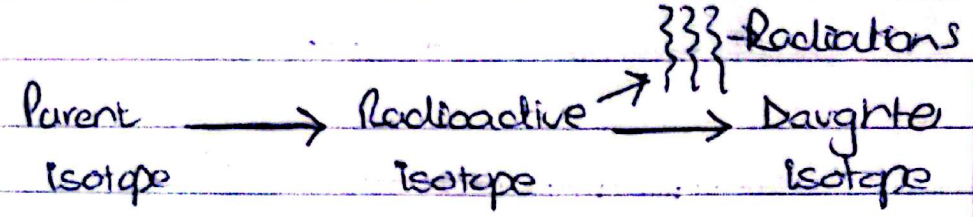
$1C = 3.7 \times 10^4 Rd$

Types of Radioactivity

There are two types of radiooctivity

Natural Radioactivity:- This process is spontaneous and occurs naturally. Natural radioactivity occurs in unstable nuclei.

Artificial Radioactivity:- This process occurs due to an external influence and is initiated by man. It occurs in stable nuclei.



Laws of Radioactivity:-

- Radioactive decay is the result of decay of nucleus.
- The nucleus's rate of decay is independent of temprature and pressure.
- The physical and chemical properties of daughter nuclei are different from parent nuclei.
- Radioactivity is dependent on conservation laws: conservation of momentum, conservation of charge and conservation of mass energy.
- The emission of energy from radioactivity is accompanied by alpha, beta and gamma particles.
- The rate of decay of radioactive element is dependent on the number of atoms present at that time.

Radioactive Elements:

- Uranium - 238 (U - 238) emit α - particle and form Thorium - 234 (Th - 234)
- Radium - 226 (Ra - 226) emit α - radiation and form Radon - 222 (Rn - 222).

QUESTION - 01

ANSWER:-

DEFINITION OF URINE:-

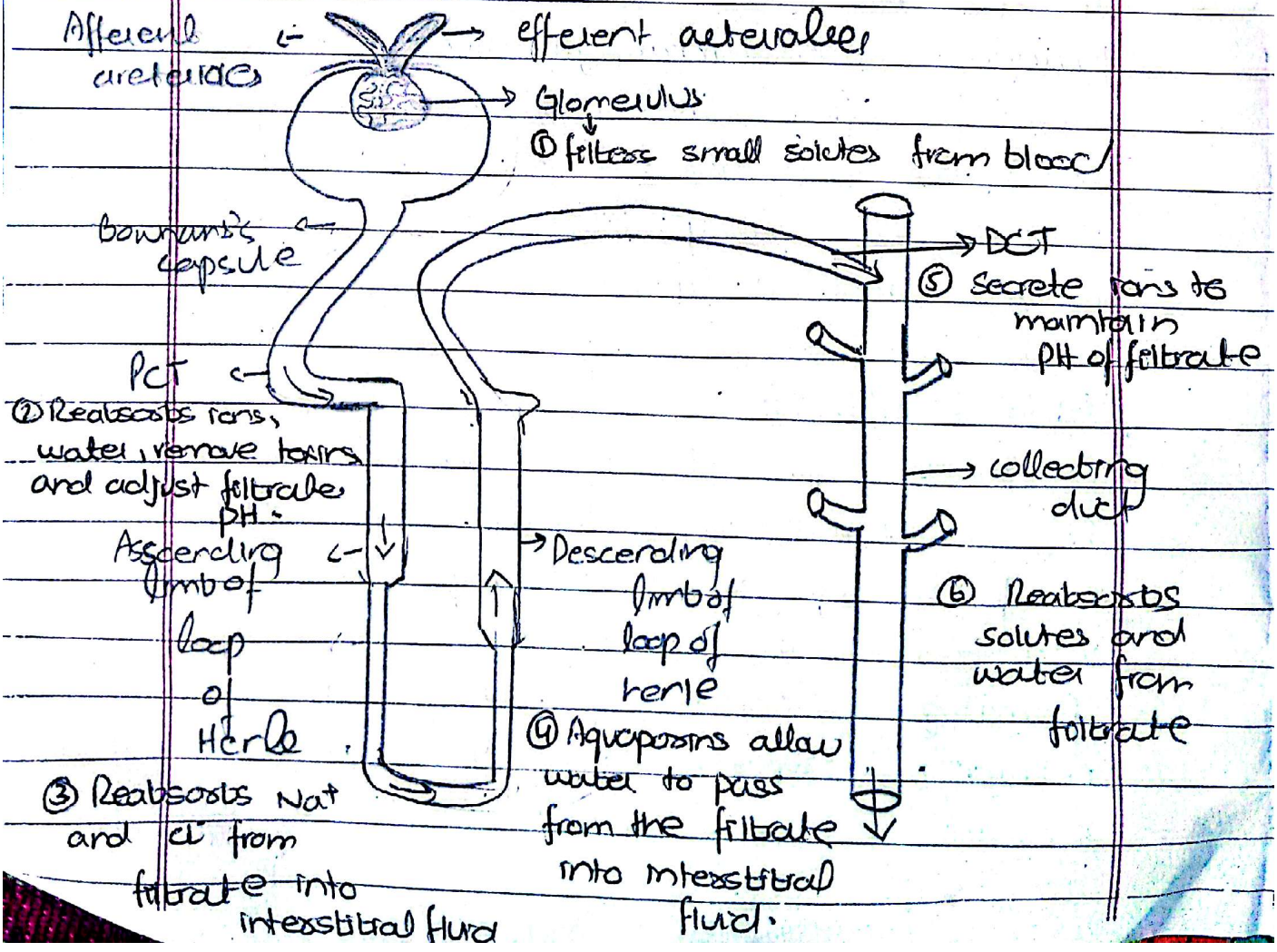
"Urine is a liquid by-product of the process of metabolism in humans and other animals." It is formed through a process called urine formation or renal filtration. and is excreted from the body through a process called excretion, via ureters, urinary bladder and urethra respectively.

URINE FORMATION:-

Waste product is eliminated from the body mainly thrugh kidney in form of urine. Kidneys play a vital role in excretion. Urine formation occurs mainly in nephron. Nephron is the major structural and functional unit of

Kidney - Nephron is further composed of

1- Bowman's capsule
2- Glomerulus
3- Afferent arterioles
4- Efferent arterioles
5- Proximal convoluted tubules
6- Descending Limb of loop of Henle
7- Ascending limb of loop of Henle
8- Distal convoluted tubule
9- Collecting duct



MECHANISM OF URINE FORMATION:

The process of urine formation involves mainly three steps.

- Glomerular filtration
- Selective reabsorption
- Secretion

• Glomerular Filtration:

Glomerular filtration occurs in glomerulus where blood is filtered. This process occurs through across three layers: the epithelium of Bowman's capsule, the endothelium of glomerular blood vessels and the membrane between these two layers.

Blood is filtered in such a way that all constituents of plasma reach the Bowman's capsule except proteins. Therefore, this process is called ultrafiltration.

• Selective Reabsorption:

About 99% of the filtrate is reabsorbed in proximal convoluted tubule, when filtrate leaves the proximal tubules, it mostly contain nitrogenous waste. This process is known as reabsorption which is achieved by active and passive transport.

Secretion:-

The next step is tubular section. The tubular cells secrete certain substances like hydrogen ions, potassium ions etc. to balance the pH of filtrate passing through the tubule. The secreted ions combine with the filtrate and form urine. The urine passes out of the nephron into the collecting duct.

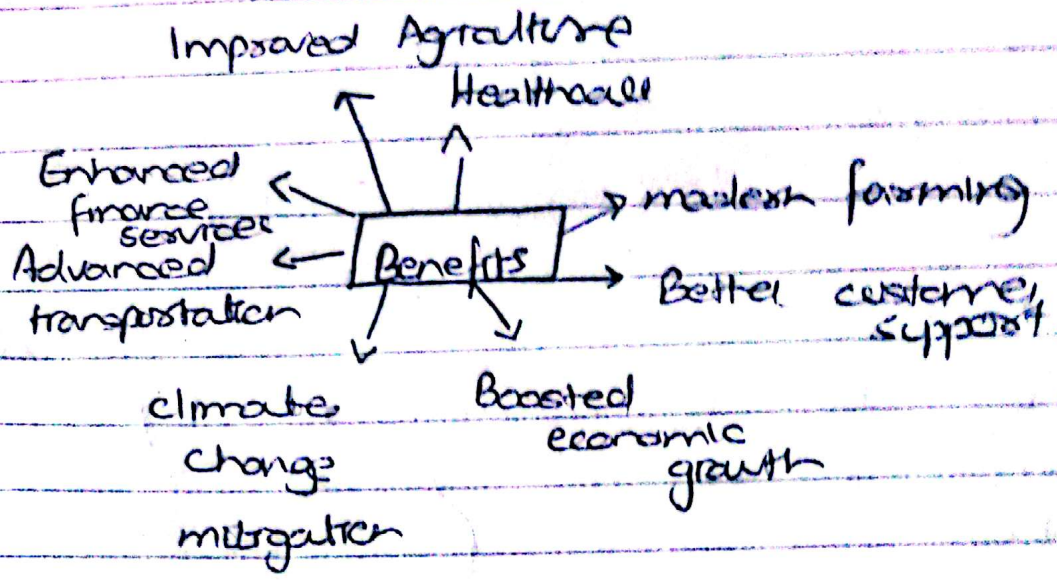
QUESTION. 04

ANSWER

ARTIFICIAL INTELLIGENCE:-

Artificial intelligence is basically ability of a machine to act, learn, think and perform task. Artificial intelligence is the simulation of human intelligence in machines that are programmed to think like human and mimic their actions. The term may also be applied to any machine that exhibit traits associated with humans, such as learning and problem solving.

Notable Benefits of Artificial Intelligence



The notable benefits of AI are

Enhanced Healthcare: AI is transforming healthcare from helping find cures faster to assisting in surgeries. It can also handle admin tasks, analyze tools and may soon power surgical robots, reducing errors and saving lives.

Climate Change Mitigation: AI can help tackle climate issues by improving clean energy systems, reducing emissions and helping government make smarter decisions.

Advanced Transports: From self-driving cars to traffic management

AI is reshaping travel - AI can be used in GPS system to plot the perfect route or traffic analysis This can all help to reduce fuel consumption and get people where they need to, more quickly.

Better Customer Support: AI chatbots now handle queries instantly, improving customer service. It also helps bussineses personalise interactions in banking, retail and more

Enhanced Finance Services: AI improves financial service by analyzing spending habits, detecting fraud, and helping firms make better choices

Modern farming: AI helps farmers to decide when to plant, water or use pesticides. It boosts crop yields and makes farming more efficient and eco-friendly.

Stronger Cybersecurity: AI can detect and stop cyber threats before they cause harm. It keeps data safe across networks by spotting attacks easily and responding fast

Boosted Economic Growth: Instead of taking jobs AI is creating new one's - Expert say AI could add $15.7 trillion to the global economy by 2030, benefiting industries from finance to tech.