

# Dos and Don'ts for the General Science & Ability Paper

Q. No. 2

Hi there – you've prepared well!

Remember, knowing the content is one thing, but presenting it in the paper exactly as required is another. Here are a few key points to keep in mind:

1. For a 5-mark part, aim to write at least 2 and at most 3 sides of the answer sheet. Often, a question has two or three parts, and the marks are divided accordingly – so address each part fairly.

2. Manage your time wisely – you have about 35 minutes per full question, which comes down to around 8 minutes for each 5-mark part. Stick to this to avoid rushing later.

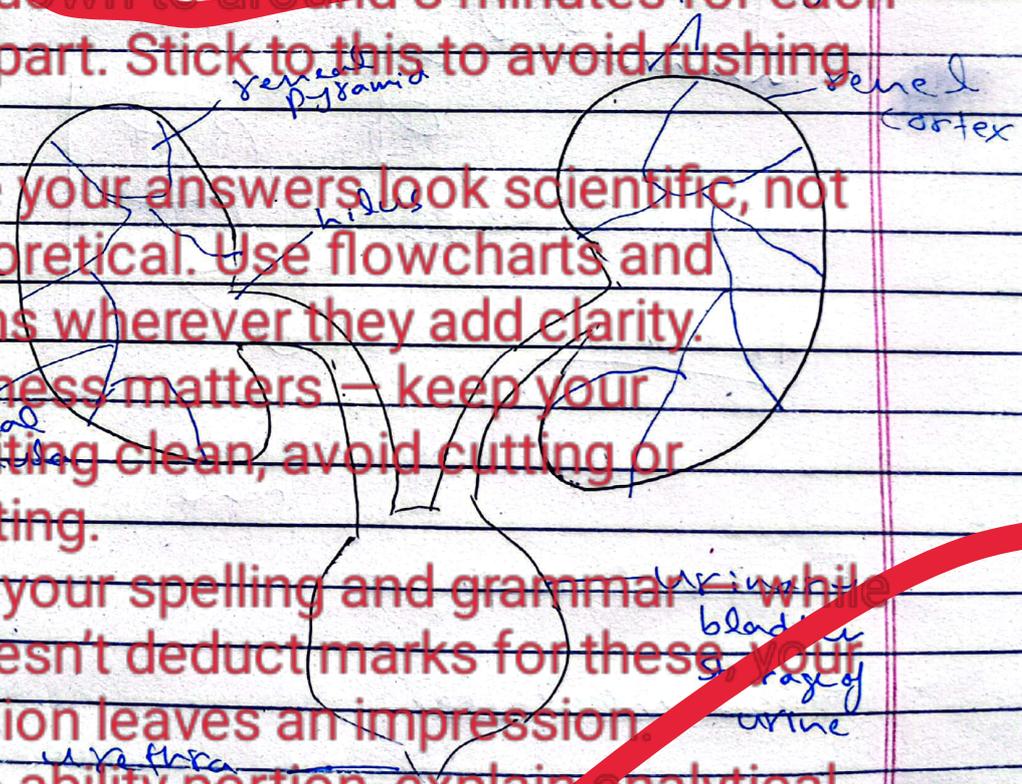
3. Make your answers look scientific, not just theoretical. Use flowcharts and diagrams wherever they add clarity.

4. Neatness matters – keep your handwriting clean, avoid cutting or overwriting.

5. Mind your spelling and grammar. GSA doesn't deduct marks for these, but your expression leaves an impression.

6. In the ability portion, explain analytical ability questions in words. For a 5-mark part, show all steps and provide clear explanations.

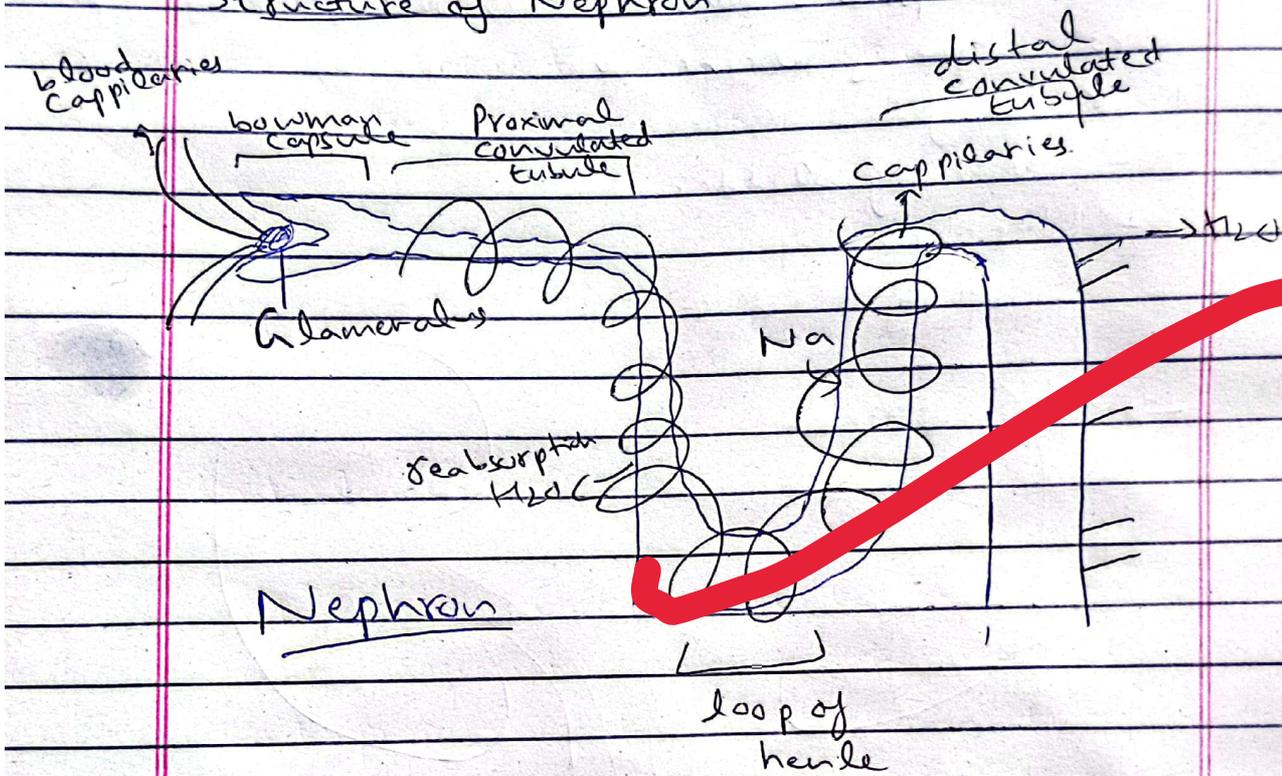
Good luck for CSS 2026 – you're going to ace it, in sha Allah! ✨



# Nephron

Nephron is the structural and functional unit of kidney. It is involved in the active production of urine and removing nitrogenous waste, and absorbing essential nutrients, and water from the body.

## Structure of Nephron



## Nephron

## Function of Nephron

### 1- Bowman capsule

→ A network of blood capillaries enter Bowman capsule. This network is called glomerulus.

→ Bowman capsule is cup-shaped and blind end. Here pressure filtration occurs, whereby, cell and other parts are removed. This is because walls are porous and deoxygenated blood from the heart came

## 2- Proximal convoluted tubule

→ The network of blood capillaries is spread throughout Nephron. Selective reabsorption of water take place

## 3- Loop of Henle

→ The descending limb is loop of henle. Here reabsorption of water take place.

→ While on the ascending limb reabsorption of  $\text{Na}^+$  take place

→ The mechanism is done by counter current Multiplier

## 4- Distal convoluted tubule

→ It is the 2<sup>nd</sup> convoluted part. Here selective reabsorption and secretion take place.

## Concentration of Urine

→ When water is less in the body, more ADH hormones take place, as a result more concentration of salt is reabsorbed and concentrated urine formation take place.

→ When water is more in the body, then less ADH is released, as a result less water is absorbed and a diluted urine formation take place.

(C)

## Unbalanced Diet

Unbalanced diet refers to a diet that does not contain the variety and proportion of essential nutrients that is needed for optimal functions of the body.

It means taking too much sugar, carbohydrate, fats and processed food, while neglecting essential others like fruits, vegetables, proteins or grain.

How unbalanced diet affects human body

### 1 - Nutrient Deficiency

An unbalanced diet leads to deficiency of nutrients in the body. For instance, deficiency of Vitamin C leads to scurvy.

### 2 - Weakened immune system

Unbalanced diet leads to weakening of immune systems. For instance, deficiency of antioxidants impairs production of white blood cells which protect the body against foreign invaders.

### 3 - Increase weight or obesity

Unbalanced diet exacerbates obesity in the body. For instance, excessive eating of processed food increases obesity in the body.

### 4 - Increases problem of cardiovascular

High intake of sodium, cholesterol increases cardiovascular problems in the body. This increases the problem of heart.

### 5- Increased problem of Digestion

Unbalanced diet increases problems pertaining to digestion. For instance, absence of grains, vegetables cause constipation and bloating.

### 6- Bone and muscle weakness

Unbalanced diet leads to bone and muscle weakness. For instance, absence of Vitamin D leads to osteoporosis of bone.

### 7- Increase Mental health problems

Deficiency of <sup>essential</sup> unbalanced diet nutrients exacerbate mental health. For instance, deficiency of Iron and Zinc exacerbate depression and anxiety.

### 8- Exacerbate chances of cancer

Similarly, absence of essential nutrients and high consumption of nutrients without antioxidant increases chances of cancer in the body.

(D)

1 - cell wall

→ Present in plants, fungi, bacteria

→ Absent in animal

Definition cell wall is a rigid layer outside cell membrane that give proper structure to the cell.

Structure of cell wall

The composition and structure of cell wall varies

→ In bacteria it is made up of peptidoglycan

→ In plant it is made up of cellulose

→ In fungi it is made up of chitin

Function of cell wall

① cell wall provide rigidity and shape to cell.

② cell wall protect against osmotic stress and environmental pressure

③ It is highly dynamic and resistant to change

## Cell membrane

Cell membrane is the outermost layer in animal cell. While in plant cell, it is present inner to cell wall.

## Structure of cell membrane

According to unit membrane model, cell membrane is composed of lipid bi layer sandwiched between inner and outer layer of protein.

According to Fluid Mosaic Model, protein layer are not continuous but are <sup>not</sup> confined to the surface of the membrane but embedded in lipid bi layer in a mosaic manner.

## Function of cell membrane

- They are involve in Endocytosis
- They are selectively permeable membrane.
- They are also involve in exocytosis

## Cytoplasm

Cytoplasm is a gel like semi fluid substance that fills the interior of the cell.

→ In plant cell, it is squeezed due to the presence of a large vacuole

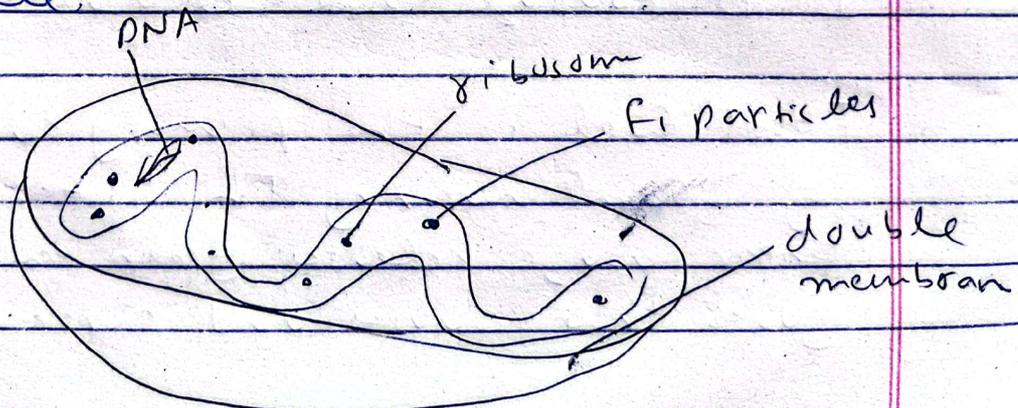
→ It contains all important organelles

### Functions

- ① Glycolysis, cytoplasmic reactions all important metabolic reactions take place in cytoplasm
- ② It transports organelles moving along cytoskeleton
- ③ All important organelles are present in cytoplasm

## Mitochondria

Mitochondria is a self replicating organelle. It is also known as the power house of the cell.



## Function of Mitochondria

- ① They manufacture and supply energy
- ② Krebs cycle, Aerobic respiration and fatty acid metabolism take place here.
- ③ store energy in the form of ATP in mitochondria

## Q.No.3

(A)

### Global warming

Global warming is a phenomenon whereby, temperature of the earth is increasing due to the presence of trapped gases released by human activities.

### Ways to Reverse Global warming

#### 1- Discourage fossil fuel usage

Fossil fuel is the primary cause of global warming. This is because their usage releases greenhouse gases that cause and exacerbate

global warming hence, by limiting usage of global warming this measure can be reduced.

## 2 - Shift to Green Energy

By shifting to green energy, global warming can be reduced. Investments in renewable energy like solarization and hydro can reduce global warming.

## 3 - Planned Urbanization

Unplanned urbanization is another reason of global warming. Hence, by effectively planning and zoning urban areas. This problem can be reduced.

## 4 - Adoption of Green transportation

Similarly, adoption of green mass transit can significantly reduce carbon emission. As it will reduce <sup>numbers of</sup> high cars on the road which will reduce fuel consumption.

## 5 - Implementing Reforestation

Forest are the natural cover to

global warming. As they utilize oxides of carbon, hence their plantation can significantly reduce global warming.

(B)

## Ceramics

Ceramics are inorganic, non-metallic materials which are formed by the application of heat and subsequent cooling.

### Properties of ceramics:

- ① They have high melting point.
- ② They are hard.
- ③ They are brittle.
- ④ Conduct low electricity.
- ⑤ High compressive strength.
- ⑥ They have high thermal insulation.
- ⑦ High resistance to electricity.
- ⑧ They have low ductile strength.
- ⑨ They have properties of chemical inertness.

## Application of ceramics

- ① They are heavily used in construction that is building tiles and bricks.
- ② They are used as electric insulators.
- ③ They are used for medical implant (bones and teeth).
- ④ They are used as household utensils.
- ⑤ They are used in glass manufacturing.
- ⑥ They are used in preparation of electronic appliances.
- ⑦ They are used in automobile parts that is in the preparation.
- ⑧ They are used as cutting tools.

(D)

## Food Additives

Food additives are the substances that are used in food in small quantity to improve its shelf life, taste, appearance and texture.

### Example

Baking soda is used to cause dough to rise. This makes it more appealing as food and increase longevity of food life

### Food Preservation

It is the process of preventing food spoilage by inhibiting microbial growth, enzyme activity.

### Examples

Boiling of milk lead to destruction of microorganism and discourage pasteurization

### Food Adulteration

It is the intentional and unintentional addition, subtraction, removal of substances in the food to reduce its quality, purity and safety.

### Example

Addition of water in milk to reduce milk efficacy & effectiveness

## Food contamination

It refers to presence of harmful substances in food that makes the food unfit for consumption.

### Example

E. coli presence in undercooked beef makes it highly hazardous for consumption, as it leads to severe digestive problems.

## Section B

Q. No. 6

(A)

Her granddaughter - only daughter of my brother.

→ only daughter of my brother  
The girl is his niece

→ That niece is granddaughter of the woman.

→ The woman must be mother of my brother.

→ So the woman is Ahsan's mother.