

(a) What is meant by transpiration? Explain in detail the significance of leaf structure in the process of transpiration.

Section - A

Q:1

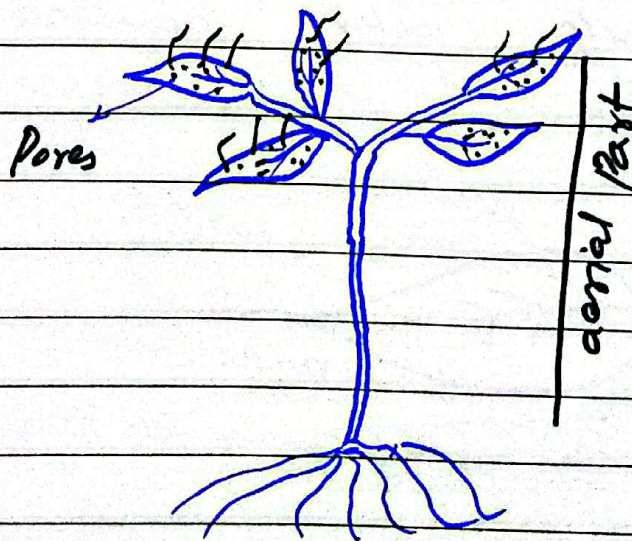
a)

Meaning of Transpiration:

Transpiration is a process in which plants remove excess water from their aerial parts such as stomata, cuticle and lenticles.

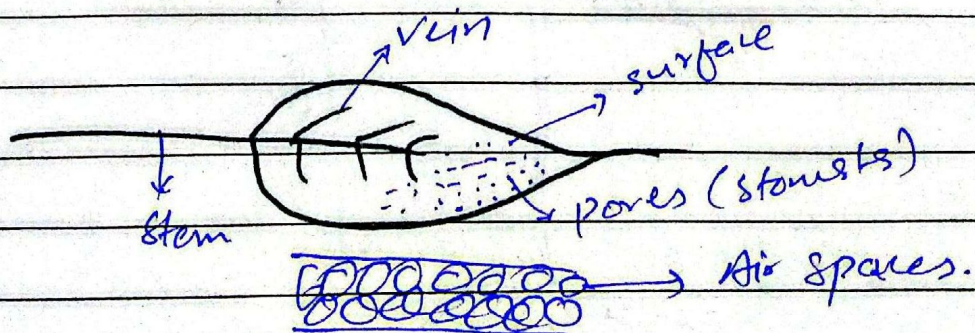
Stomata are the pores inside the leaf which help remove or stop water. Cuticle are also layers when leaves control water from day season. Lenticles are also type of openings by which breathing of gases takes place.

The process is called suction pull because of holding water or selecting water from small pores.



Significance of Leaf structure in Transpiration:

- i) **Stomata:** Stomata called sometimes stomes, are tiny pores in leaf which help evaporate or remove water vapours.
- ii) **Vein Network:** Leaf contains a network of veins by which water and food material is provided to different areas or parts of leaf.
- iii) **Thinness of Leaf:** Thinness of leaf is diffused pathways by which water rapidly comes out and remove it from the leaf.
- iv) **Air spaces:** There are also air spaces in leaf made-up of mesophyll cell which help rapid removal of water.
- v) **Surface Area:** The large surface area of leaf also help water removed from pores and other spaces.



(b) How the carbohydrates, proteins, and fats are digested in humans?

B) Digestion of Carbohydrates, Proteins and Fats in Human: Process

i) Carbohydrates: These are blocks of Sugars (steps)

Mouth: Saliva, the amylase enzyme breaks larger sugar packets in smaller ones.

↓
Stomach: stomach acid (HCL) stops saliva functioning (no digestion)

↓
Small Intestine: Here pancreatic enzyme amylase digests small sugar and turn them into Glucose

↓
Blood Stream: Glucose then transferred to the body by capillaries.

ii) Proteins: These are Acids

Mouth: Only the process of chewing

↓
Stomach: HCL (stomach juice) + Pepsin enzyme turn protein into peptides.

↓
Small Intestine: Here pancreatic enzyme, Trypsin breaks peptides in Amino acid

↓
Blood stream: These Amino Acids go through capillaries

iii **Fats:** These are oily and oily materials

Mouth: Just chewing of fatty oils



Stomach: Just mixing of oils



Small Intestine: Bile (Juice from Liver) breaks big drops of fats into small ones (Emulsification). Then, pancreatic enzyme, Lipase breaks droplets into Fatty acid or Glycerol.

Blood stream: These are transferred into blood ~~with~~ from Lymph.

(c) How a bacterial cell is different from a plant cell?

c)	Bacterial cell	Plant cell
i)	These are Prokaryotic cells and does not have 'Nucleus'	These are Eukaryotic and have Nucleus in the center.
ii)	These are flexible in size and having the size of (0.5-5) μm	These are big in size as compared to bacterial cells, they are rigid in shape and possess size more than 30 μm
iii)	They are "Heterotrophic" because they rely on others for food	They are "Autotrophic" and they make their own by "Photosynthesis".
iv)	They are not membrane attached molecules, because they are flexible and have no interstitial organelles.	They are membrane bounded and they have fixed shape with nucleus on center and other organelles are around it.
v)	They have circular DNA	Their DNA is in ladder form.

(vi) NO large vacuole

Having a large vacuole.

(vii) Development via Binary fission

Their development happens with cell division.

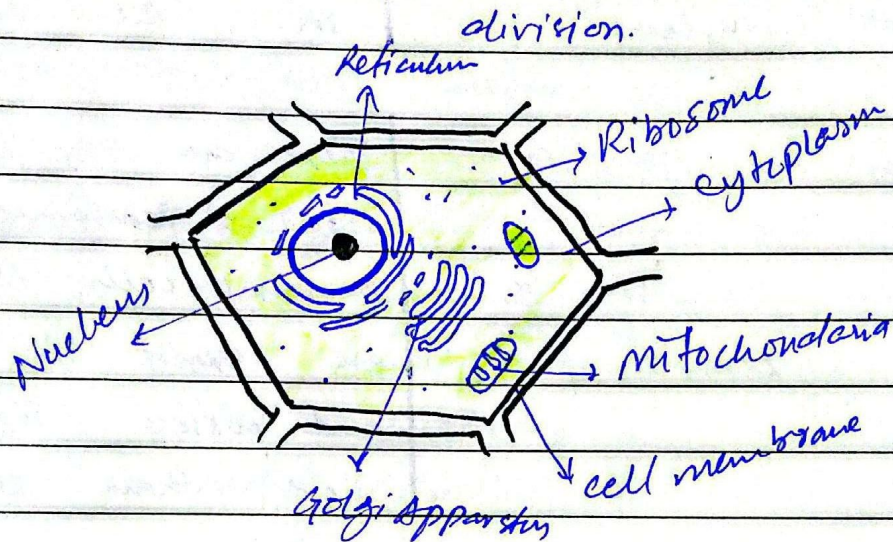


FIG-01: ~~Plant~~ Plant cell

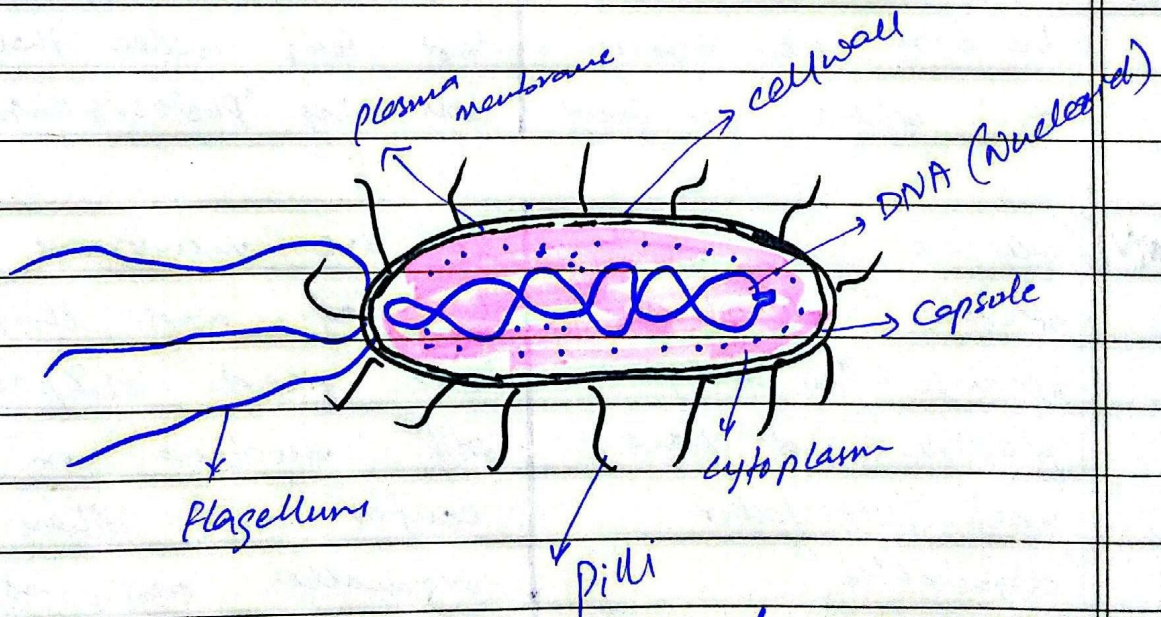


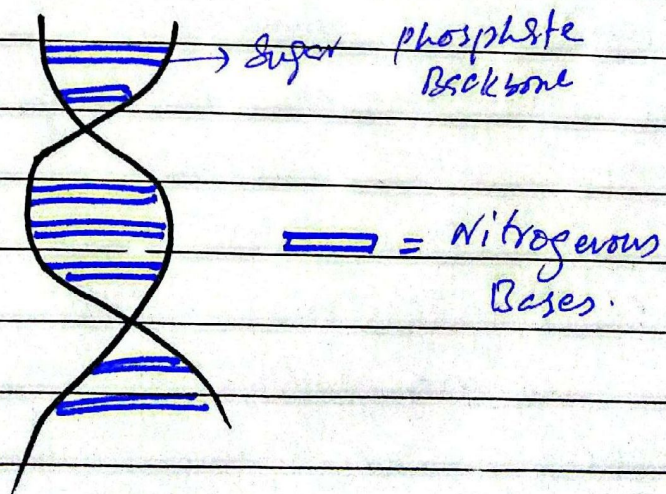
FIG: 02 Bacterial cell

D) i) DNA (Deoxyribonucleic Acid)

It is a type of nucleic acid that contains genetic instructions. It is made-up of monomers and nucleotides. DNA looks like ladder shape which is made-up of phosphate. There is hydrogen bonding between its bases.

Other features:

- DNA has deoxyribose sugar
- It is double stranded molecule called Adenine (A), guanine (G), cytosine (C) and thymine (T)
- The pairing takes place as AT & GC
- DNA is present in the nucleus.



ii) RNA (Ribonucleic Acid)

This molecule consists of "Ribose sugar" and have chains of chemical compounds called nucleotides. There are three types of RNA.

a. **rRNA**: A Ribosomal molecules helps in protein synthesis.

b. **mRNA**: It is created by DNA for the instruction of creating protein.

c. **tRNA**: It carries amino acids to mRNA

Other features:

a. These single stranded

c. same molecules as DNA, but difference in pairing; AU & C

d. RNA is genetic material of Bacteria & viruses.

e. RNA is found in cytoplasm and Nucleus.