



NEET-AIIMS

BIOLOGY

ZOOLOGY-II

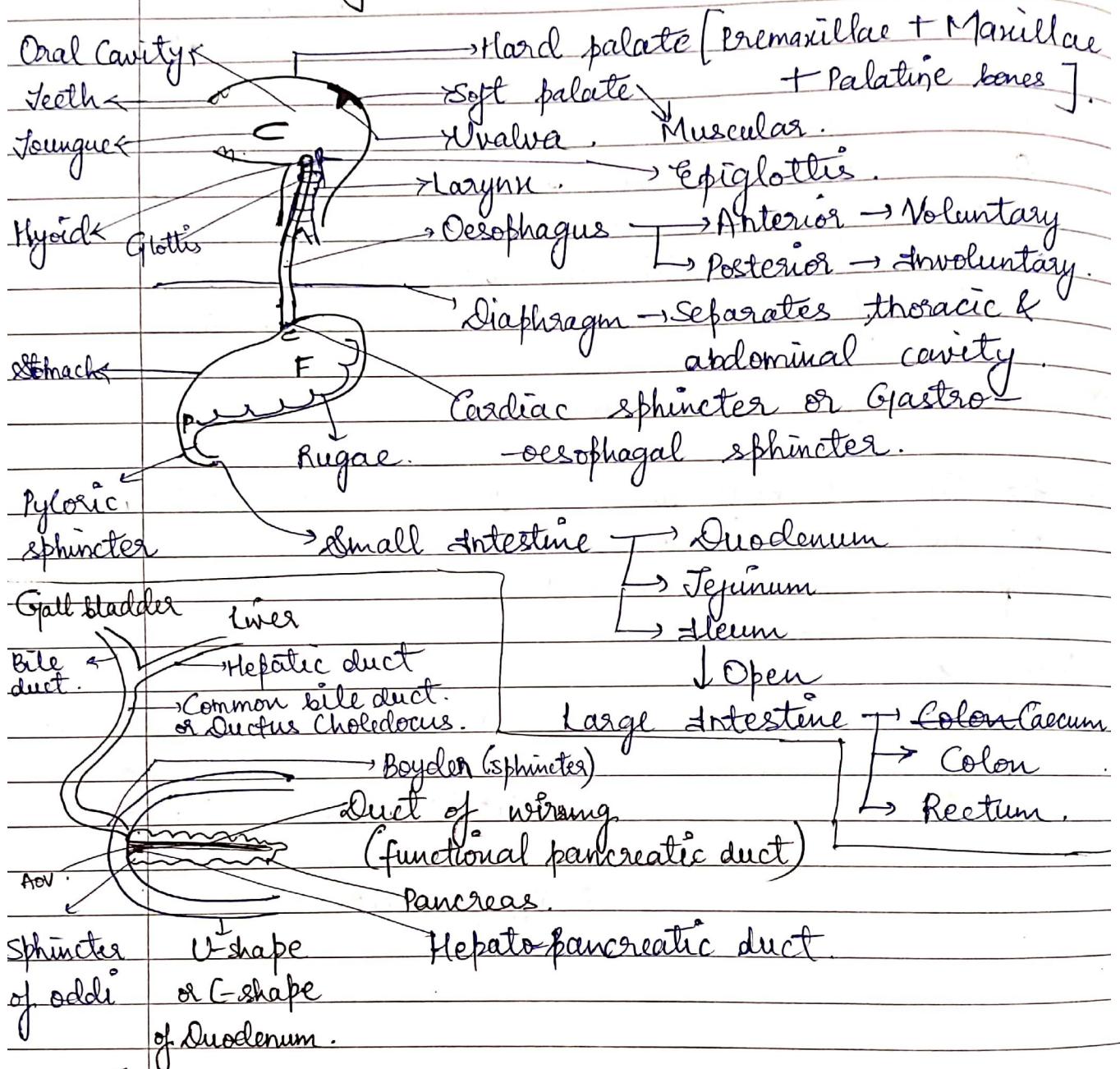


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"Human Physiology"

Digestion and Absorption



* Sphincter of Oddi → Opening of ductus choledocus [Common bile duct] into pancreatic duct [Duct of Wirsung] is guarded by sphincter of boyden.

Gall bladder



Bile duct

Liver



Hepatic duct

↓
Unite & form



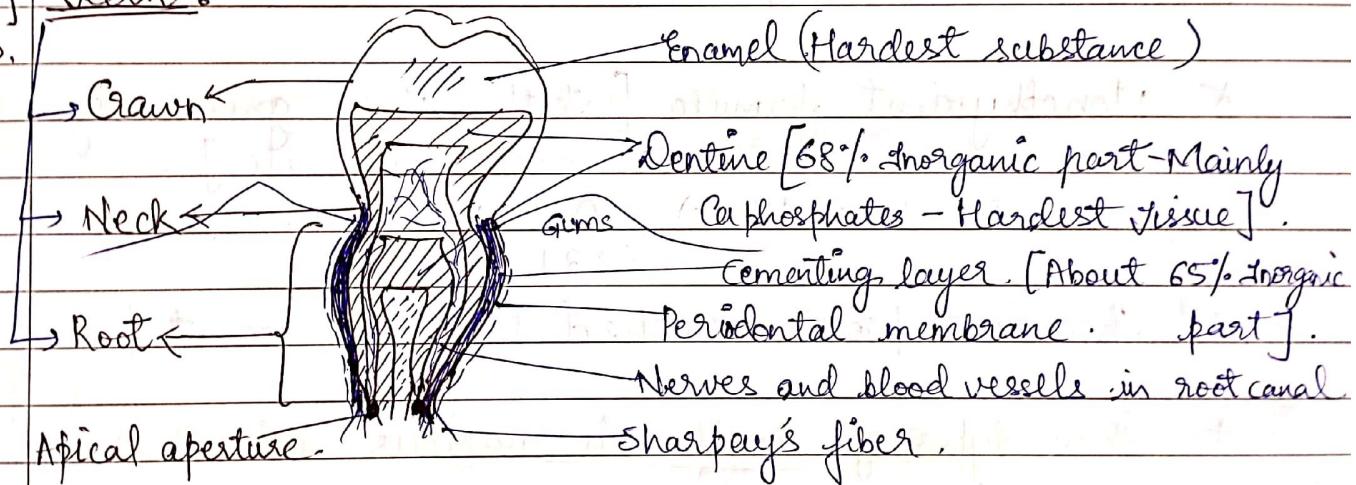
Common bile duct or Ductus choledocus.
↓ unite.

functional Pancreatic duct [Duct of wireung].
↓ Have

Ampulla of water of Hepato-pancreatic duct
(swelling). ↓ opens

into duodenum by sphincter of oddi.

[i] Teeth :-



* (a) Human teeth

(a) Heterodont → [Show homologous organ].



→ Incisors → Biting & Cutting.



→ Canines → for tearing.



→ Premolars } Grinding.



→ Molars

- Odontoblast → teeth forming cells.
→ Mesodermal in origin.
- Major part of teeth is dentine - connective tissue harder than bone.
- shiny covering of crown is enamel [hardest substance & ectodermal]
- Enamel forming cells are ameloblasts.
- Teeth eating cells are odontoclasts.
- Human teeth is heterodont, diphyodont [grow twice in life]
 - ① Milk teeth - $\frac{2102 \times 2}{2102} = 20$
 - ② Permanent teeth - $\frac{2123 \times 2}{2123} = 32$

* Monophyodont formula [teeth those grow only once in life] -

$$32 - 12 = 12 \Rightarrow \frac{0021 \times 2}{0021} = 2$$

[C] Thecodont [teeth attached to bony socket].

Other types of teeth in various animals:-

- 1) Acrodont → Not directly attached to jaw bone.
→ laterally attached to mucous membrane of jaw.

Eg. Majority of reptiles, amphibians, fishes

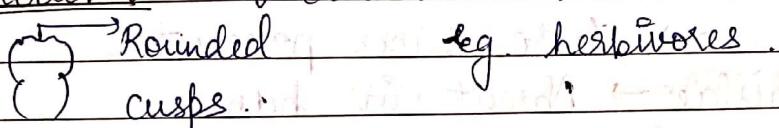
- 2) Lophodont → teeth have transverse ridges
Eg. Elephant

* Trunks of elephant are modified incisors.

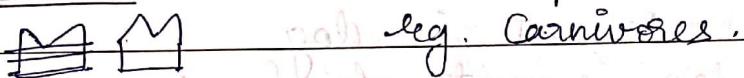
- 3) Solenodont → Soft dentine. Eg. Sheep.
- 4) Pleurodont → Teeth bend inner side to prevent escape of prey. Eg. Snake.
- 5) Hemodont → All teeth alike. Eg. Whale, shark.

* Note → Frog have acrodont, polyphyodont, maxillary. [Found in upper jaw] and homodont set teeth.

* Bunodont → Teeth with rounded cusps.



* Secodont → Teeth with pointed cusps.



* Note →

→ (1) Maximum teeth in (1) Opiareum (2) Horse & pig (SO).

(2) Vomerine teeth found in vomer bone of frog (Amphibians).



(ii) Tongue [Lingula] :-

→ Nuhn's gland → Mucous secreting gland of tongue.

* Tongue → Voluntary muscle.

But → Not attached to bone.

→ Posterior Fornix - fungiform membrane rest on hyoid. Tip & sides → Salt. Tip → Sweet.

* Lingual papilla → About 10,000

→ Taste buds present in them.

* following types of papillae :-

- 1) Filiform papillae → No taste buds
→ Maximum & smallest.
- 2) Fungiform → Red colour
→ Maximum on tip & sides.
→ Taste buds present.
- 3) Circum vallate → Largest, V-shaped.
→ On posterior side
→ Taste buds present.
- 4) Foliate papillae → Absent in humans
→ Taste buds absent.
→ Present in dog.

* Note → ① In dog, sweat gland present on tongue (panting of dog) [Perspiration].
 ② Sulcus transversorum → Inverted V-shaped structure, separates anterior oral cavity & posterior pharyngeal region.

• Salivary Glands → * 3 pairs in humans (Total - 6)

(1) Parotid glands :-

⇒ Stenson's duct → Largest → Behind inner side of cheek.

(2) Sub-lingual gland :-

⇒ Duct of rivinus → Smallest → Situated beneath the tongue → Secretes minimum amount of saliva.

(3) Sub-mandibular :-

⇒ Watson's duct → Secretes maximum amount of saliva.

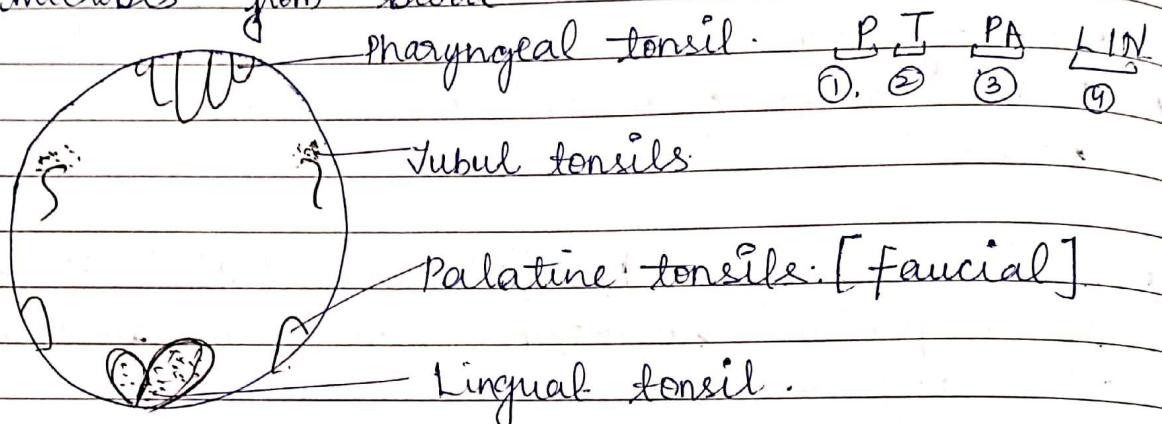
- Situated at corner of jaw
- * No salivary gland in oral cavity, only their duct open into oral cavity.
- * In mumps [viral disease], swelling of parotid salivary gland is seen.
- * Poison glands of snake are modified parotid salivary glands.

- Saliva contains H_2O [Maximum], Na^+ , K^+ , Cl^- , HCO_3^- , Mucin (protein), lysozyme, salivary amylase ($pH = 6-8$)
→ Per day secretion $\rightarrow 1$ to 1.5 L.
- After mastication of food, when food fully mix with saliva, then bolus is formed.
Starch $\xrightarrow{\text{Salivary amylase}}$ Maltose
 $pH = 6-8$.
- When tongue pushes bolus to voluntary part of oesophagus, then deglutition occurs.

(ii) Oesophagus :-

- From oesophagus to rectum, alimentary canal have 4 layers [Outer to inner]
 - ① Serosa \rightarrow Absent in oesophagus but fibrous tunica adventitia present.
 - ② Muscularis
 - ③ Sub mucosa
 - ④ Mucosa.
- * Upper $\frac{1}{3}$ part \rightarrow Voluntary \Rightarrow Meissner's plexus & overbach plexus absent.

- # Waldayer's Ring :-
- Arrangement of tonsil in pharyngeal & inner oral region.
 - Tonsils are lymph nodes, trap pathogenic microbes from blood.



- 1) Pharyngeal tonsil →
 - found in nasopharyngeal region
 - called adenoids
 - Naturally disappears when children reach 7 years of age.
- 2) Jubal tonsil →
 - Also found in nasopharynx.

- 3) Palatine tonsil →
 - If infected, then result in throat pain.
 - Infection called tonsillitis. Surgical removal is needed in heavy infection.
 - No page Bawji AS.

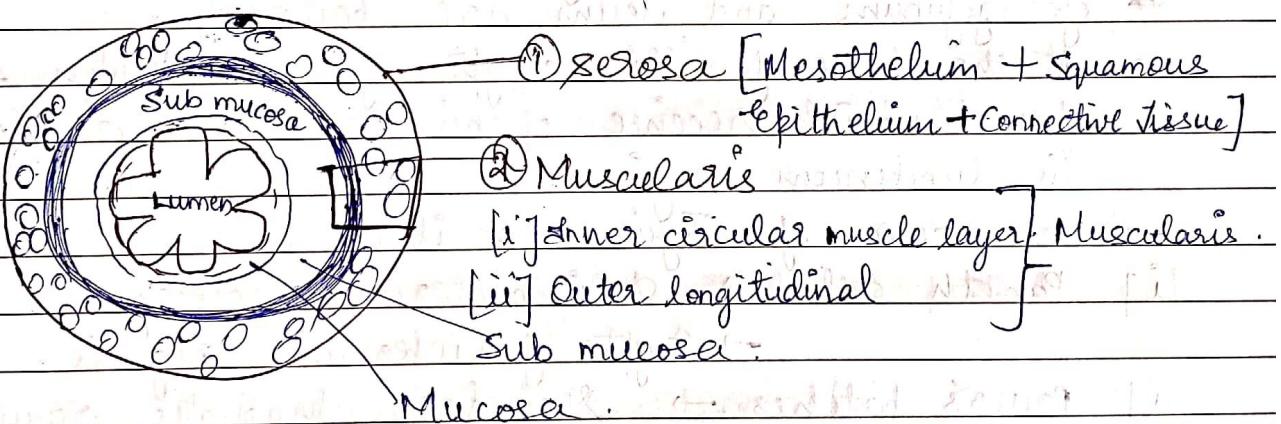
- Note** → N → P - GLT → BB - AS.
- | | |
|---|--|
| <ul style="list-style-type: none"> (1) External nares (2) Nasal cavity (3) Internal nares or choanae | <ul style="list-style-type: none"> (4) Pharynx (5) Glottis (6) Larynx → Trachea |
| Oral → Naso → Laryngotracheal | |

(7) Bronchi (8) Bronchioles (9) Alveolar sac.

- * HiAT → Those points where oesophagus penetrate the muscular voluntary diaphragm.
- * Glottis → Inner cavity opening of larynx / trachea.
→ Made up of elastic cartilage.
- * Epiglottis → An elastic cartilage flap like structure
- * Epi → closes the glottis during swallowing.
→ Prevent entry of food into respiratory passage.

Histology of Alimentary Canal :-

⇒ Have following layers → (1) Serosa (2) Muscularis
(3) Sub-mucosa (4) Mucosa [outer to inner].



- In stomach the inner circular muscle layer, an oblique muscle layer is also present.
So more muscular & more peristalsis in stomach.
- Muscularis have myometric plexus, overback plexus [btw longitudinal & circular muscle], have ~~AT~~ fibers of ANS - nerve fibers of ANS (sympathetic & parasympathetic)
- Sub-mucosa is made up of areolar connective tissue, so blood vessels & nerves present.
- In duodenum, sub-mucosa have mucous secreting = Brunner's gland.

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$$\text{Starch} \xrightarrow{\text{Salivary amylase}} \text{Maltose}$$

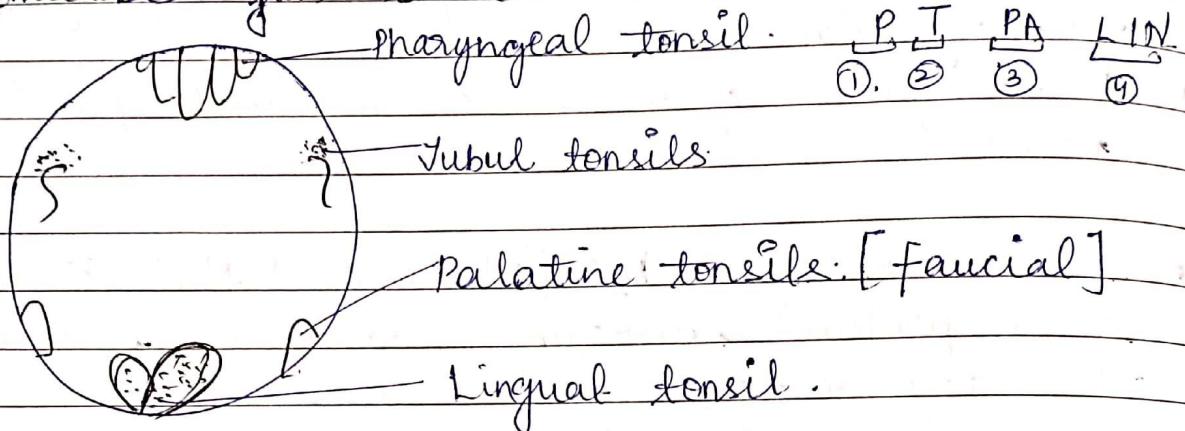
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- Not page Bawii AS.

→ Note → N → P → GLT → BB - AS.

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- ② Nasal cavity
- ③ Internal nares or choanae

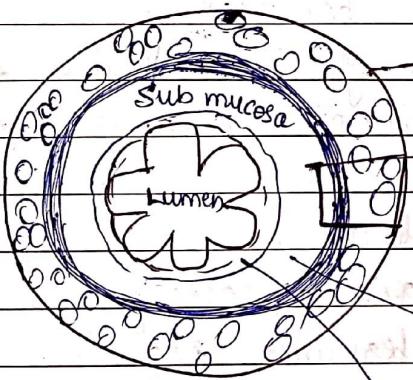
- ④ Pharynx → Oral, Naso, Laryng.
- ⑤ Glottis
- ⑥ Larynx → Trachea

⑦ Bronchi ⑧ Bronchioles ⑨ Alveolar sac.

- * HIATUS → Those points where oesophagus penetrate the muscular voluntary diaphragm.
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Histology of alimentary Canal :-

- ⇒ Have following layers → ① Serosa ② Muscularis
③ Sub-mucosa ④ Mucosa, [outer to inner].



① Serosa [Mesothelium + Squamous Epithelium + Connective tissue]

② Muscularis

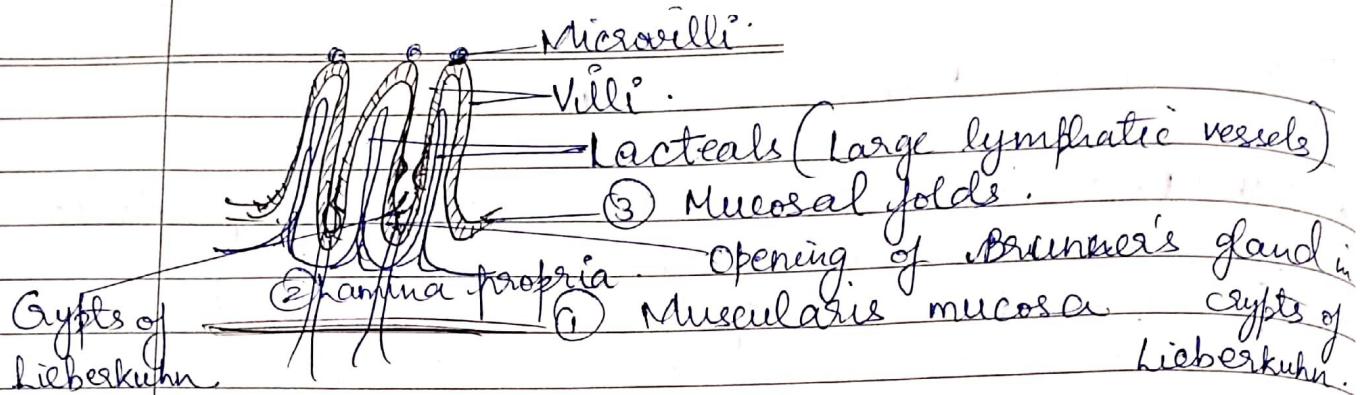
[i] inner circular muscle layer] Muscularis .

[ii] outer longitudinal]

Sub-mucosa -

Mucosa .

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- Sub-mucosa is made up of areolar connective tissue, so blood vessels & nerves present.
- In duodenum, sub-mucosa have mucous secreting classmate Brunner's gland



→ Meissner's plexus → Regulate secretion of mucus & digestive enzymes-juice.

→ Mucosa :-

- - Have villi & microvilli in small intestine, which increases surface area of absorption.
- Villi of duodenum region are blunt; while villi of jejunum and ileum are pointed.
- At the base of villi, crypts of Lieberkühn cells found which receive opening of Brunner's gland in duodenum region.
- In mucosa of Jejunum & Ileum,
 - [i] Paneth cells → Anti-bacterial property
 - Crypts of Lieberkühn region.

[ii] Payer's patches → Secondary lymphatic organs.

[iii] Argentaffin cells → Hormone secreting.

[iv] Epithelial cells → Mucus

At crypts of Lieberkühn region.

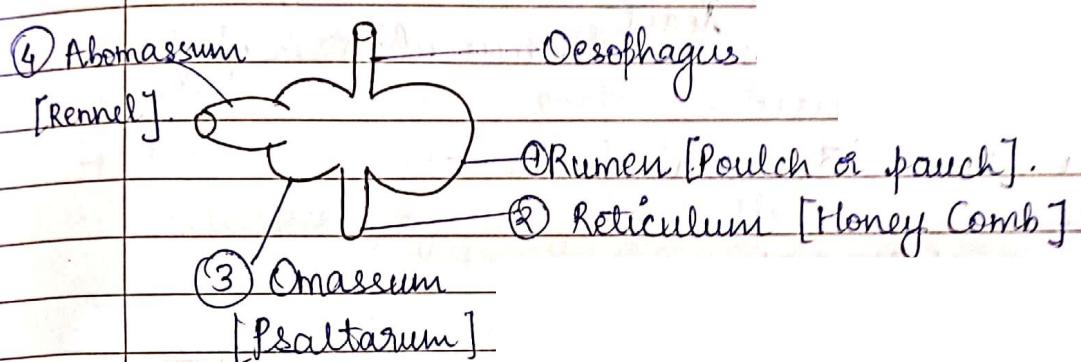
* Succus entericus [Intestinal juice] formed at mucosal region, have mucus [from goblet cells & Brunner's gland] and Brush border enzyme. [at those parts where more microvilli.]

→ Brushborder enzymes have dipeptidase, disaccharidase,

lipase, amylase [never nuclease].

[iii] Stomach :-

→ Compound stomach of ruminants e.g. Cow, Sheep, Buffalo, Horse.



① Rumen → Related to storage [water cells].

→ Rumen & omassum have rumnococcus & other symbiotic microbes for fermentation.

② Reticulum → for regurgitation.

③ Omassum → Absent in camel & deer.

④ Abomasum → True stomach because have gastric gland, secretes HCl and lining of glandular epithelium.

* Note :- Rumen, reticulum & omassum are not true stomachs because have cornified epithelium lining.

[b] Human stomach :-

