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GI Digestion, Enzymes & Hormonal Regulation

Exam — GI Physiology

High-school/pre-med-level questions on gastrointestinal digestion, key digestive enzymes, and hormonal control (gastrin, secretin, CCK, etc.).

32 items — Printable Exam

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1 **Which part of the digestive system is the MAIN site where most chemical digestion and absorption of nutrients occur?**

- A Mouth
- B Stomach
- C Small intestine
- D Large intestine
- E Esophagus

2 **Salivary amylase begins the digestion of which type of nutrient?**

- A Proteins
- B Starch (polysaccharides)
- C Lipids (triglycerides)
- D Vitamins
- E Minerals

3 **Which of the following is CORRECT about salivary amylase in the stomach?**

- A It continues to work best at very low pH
- B It is rapidly inactivated by the acidic pH of gastric juice
- C It is converted into pepsin by hydrochloric acid
- D It is responsible for most protein digestion in the stomach
- E It is a hormone that regulates acid secretion

4 **Which enzyme is secreted by chief cells of the stomach as an inactive precursor?**

A Pepsin

B Pepsinogen

C Trypsinogen

D Pancreatic amylase

E Lipase

5 **Pepsin, the active form of pepsinogen, mainly digests:**

A Proteins into smaller peptides

B Starch into maltose

C Triglycerides into fatty acids only

D Vitamins into amino acids

E Cellulose into glucose

6 **Which pair correctly matches enzyme with its MAIN substrate?**

A Pancreatic amylase – proteins

B Pepsin – starch

C Lactase – lactose

D Lipase – DNA

E Trypsin – triglycerides

7 **Which statement about bile is TRUE?**

A Bile contains powerful digestive enzymes for breaking down proteins

B Bile is produced by the pancreas and stored in the spleen

C Bile contains bile salts that emulsify fats but has no digestive enzymes

D Bile directly converts triglycerides into amino acids

E Bile's main role is to digest carbohydrates

8 **Which enzyme is MOST important for the digestion of fats in the small intestine?**

A Salivary lipase

B Gastric lipase

C Pancreatic lipase

D Pepsin

E Pancreatic amylase

9 **Which of the following enzymes is ACTIVATED in the small intestine by the brush-border enzyme enterokinase (enteropeptidase)?**

A Pepsinogen → pepsin

B Trypsinogen → trypsin

C Pancreatic amylase → active amylase

D Lipase → colipase

E Lactase → glucose

10 **Trypsin, chymotrypsin and carboxypeptidase are primarily involved in the digestion of:**

A Carbohydrates

B Proteins

C Lipids

D Nucleic acids

E Vitamins

11 **Which combination correctly matches SITE and DIGESTIVE SECRETION?**

A Stomach – pancreatic amylase

B Mouth – pepsin

C Pancreas – bicarbonate-rich fluid and digestive enzymes

D Liver – pepsinogen

E Small intestine – bile production

12 **Which of the following BEST explains why the pancreas secretes bicarbonate into the duodenum?**

A To lower the pH of the stomach contents

B To neutralise acidic chyme from the stomach and provide a suitable pH for pancreatic enzymes

C To activate pepsin in the small intestine

D To emulsify fats

E To digest starch directly

13 **Which GI hormone is primarily released by the stomach in response to peptides and stomach distension, and stimulates gastric acid secretion?**

A Secretin

B Cholecystokinin (CCK)

C Gastrin

D Insulin

E Glucagon

14 **Secretin is released from the duodenum mainly in response to:**

A Fats in the duodenum

B Carbohydrates in the stomach

C Acidic chyme entering the duodenum from the stomach

D High blood glucose levels

E Stretch of the sigmoid colon

15 **Cholecystokinin (CCK) is released from the small intestine primarily in response to:**

A Fats and amino acids in the duodenum

B Low blood calcium

C High blood glucose

D Gas in the large intestine

E Water in the stomach

16 **Which hormone stimulates the gallbladder to contract and release bile into the duodenum?**

A Gastrin

B Secretin

C Cholecystokinin (CCK)

D Insulin

E Adrenaline

17 **Which of the following is a correct MATCH between hormone and its MAIN effect on the stomach?**

A Gastrin – increases gastric acid secretion and motility

B Secretin – strongly increases gastric acid secretion

C CCK – speeds up gastric emptying

D Insulin – increases gastric acid secretion

E Glucagon – opens the lower esophageal sphincter

18 **Secretin's effect on the STOMACH is mainly to:**

A Increase acid secretion and speed up gastric emptying

B Decrease gastric acid secretion and slow gastric emptying

C Increase gastric mucus secretion only

D Convert pepsinogen into pepsin

E Stimulate ghrelin secretion

19 Which statement best describes the overall COORDINATED action of secretin and CCK on the pancreas?

A Secretin stimulates bicarbonate; CCK stimulates enzyme-rich pancreatic juice

B Both only stimulate bicarbonate secretion

C Both only stimulate insulin release

D Secretin stimulates enzyme release; CCK stimulates bicarbonate

E Both hormones inhibit the pancreas completely

20 Most carbohydrates are finally absorbed from the small intestine into the blood in which form?

A Polysaccharides

B Disaccharides

C Monosaccharides (mainly glucose, galactose, fructose)

D Amino acids

E Fatty acids

21 **Glucose and galactose are absorbed into intestinal epithelial cells mainly by:**

- A Simple diffusion across the lipid bilayer
- B Sodium-dependent cotransport (SGLT1) on the luminal membrane
- C Exocytosis from the intestinal lumen
- D Endocytosis via chylomicrons
- E A Na^+/glucose antiporter

22 **After glucose enters an intestinal epithelial cell via SGLT1, it leaves the cell into the blood mainly by:**

- A Facilitated diffusion via GLUT2 on the basolateral membrane
- B Simple diffusion
- C Active transport using ATP on the luminal side
- D Endocytosis into lymphatic vessels
- E Conversion to triglycerides first

23 **In a person who completely lacks the enzyme lactase, which of the following is most likely to occur after drinking milk?**

- A Lactose is efficiently digested into glucose and galactose
- B Lactose passes undigested into the large intestine and is fermented by bacteria
- C Lactose is absorbed directly as a disaccharide
- D Lactose is digested only by pepsin
- E Lactose is converted into fatty acids by bile

24 **Which of the following is a TRUE statement about protein digestion?**

A Protein digestion occurs only in the stomach

B Pepsin in the stomach and pancreatic proteases in the small intestine both contribute to protein digestion

C Brush-border enzymes do not participate in protein digestion

D Proteins are absorbed intact without digestion

E Only pancreatic enzymes digest proteins; the stomach plays no role

25 **Which combination correctly pairs a GI hormone with its PRIMARY stimulus for release?**

A Gastrin – low pH in the stomach (very acidic)

B Secretin – acidic chyme in the duodenum

C CCK – low blood pressure

D Gastrin – high blood glucose

E Secretin – presence of fat in the colon

26 **Which of the following is a CORRECT statement about the effect of VERY low pH (high acidity) in the stomach on gastrin secretion?**

A Very low pH strongly stimulates gastrin secretion

B Very low pH inhibits gastrin secretion (negative feedback)

C Gastrin secretion is unaffected by pH

D Very low pH converts gastrin into pepsin

E Very low pH stimulates CCK only

27 Which statement about the LARGE intestine is CORRECT regarding digestion and absorption?

A It is the main site of enzymatic protein digestion

B It plays a major role in water and electrolyte absorption

C It secretes large amounts of pancreatic enzymes

D It absorbs most fats in the diet

E It produces bile for fat emulsification

28 Which statement describes the MAIN role of brush-border enzymes in the small intestine?

A They are secreted into the lumen by the pancreas

B They are membrane-bound enzymes that complete the final steps of digestion at the surface of enterocytes

C They are hormones that regulate appetite

D They digest only fats and not carbohydrates or peptides

E They neutralise stomach acid

29 A patient with severe chronic pancreatitis has greatly reduced secretion of pancreatic enzymes. Which nutrient's digestion is MOST severely affected?

A Carbohydrates only

B Proteins only

C Fats (lipids) most severely, but also proteins and carbohydrates

D Vitamins only

E Minerals only

30 Which of the following BEST explains why bile salts are important for fat absorption?

A They directly break peptide bonds in proteins

B They emulsify fat, forming small droplets and micelles that increase the surface area for pancreatic lipase and aid absorption

C They convert triglycerides into amino acids

D They are the only source of lipase

E They are hormones that stimulate lipase production in the brain

31 Which statement correctly links a GI hormone to its EFFECT on gastric emptying?

A CCK slows gastric emptying when fat is present in the duodenum

B Gastrin strongly slows gastric emptying

C Secretin speeds up gastric emptying to move acid quickly

D No hormone affects gastric emptying

E Insulin directly controls gastric emptying

32 **Which of the following is NOT a digestive enzyme?**

A Pepsin

B Pancreatic lipase

C Bile salts

D Trypsin

E Lactase

Answer Key

#	Ans	Answer Text
1	C	Small intestine
2	B	Starch (polysaccharides)
3	B	It is rapidly inactivated by the acidic pH of gastric juice
4	B	Pepsinogen
5	A	Proteins into smaller peptides
6	C	Lactase – lactose
7	C	Bile contains bile salts that emulsify fats but has no digestive enzymes
8	C	Pancreatic lipase
9	B	Trypsinogen → trypsin
10	B	Proteins
11	C	Pancreas – bicarbonate-rich fluid and digestive enzymes
12	B	To neutralise acidic chyme from the stomach and provide a suitable pH fo...
13	C	Gastrin
14	C	Acidic chyme entering the duodenum from the stomach
15	A	Fats and amino acids in the duodenum
16	C	Cholecystokinin (CCK)
17	A	Gastrin – increases gastric acid secretion and motility
18	B	Decrease gastric acid secretion and slow gastric emptying
19	A	Secretin stimulates bicarbonate; CCK stimulates enzyme-rich pancreatic j...
20	C	Monosaccharides (mainly glucose, galactose, fructose)
21	B	Sodium-dependent cotransport (SGLT1) on the luminal membrane
22	A	Facilitated diffusion via GLUT2 on the basolateral membrane
23	B	Lactose passes undigested into the large intestine and is fermented by b...
24	B	Pepsin in the stomach and pancreatic proteases in the small intestine bo...
25	B	Secretin – acidic chyme in the duodenum
26	B	Very low pH inhibits gastrin secretion (negative feedback)
27	B	It plays a major role in water and electrolyte absorption
28	B	They are membrane-bound enzymes that complete the final steps of digesti...
29	C	Fats (lipids) most severely, but also proteins and carbohydrates
30	B	They emulsify fat, forming small droplets and micelles that increase the...
31	A	CCK slows gastric emptying when fat is present in the duodenum
32	C	Bile salts