Wednesday, 30th of January 2008 (14.30-16.30

University of Buea

Faculty of Health Sciences

Programme in Medicine

MED 303

(Gastrointestinal and Renal Physiology)

First Continuous Assessment (2007-2008)

Instructions: *Each of the numbered items or incomplete statements in this test is followed by answers or by completions of the statements. Select the ONE lettered answer or completion that is BEST in each case*

Which statement(s) regarding endocrine glands is/are incorrect?

a. they produce hormones.
b. they secrete their products into the blood.
c. they are comprised of epithelial tissue.
d. they are all controlled by the nervous system.
e. they are ductless.

____ 2. Neurosecretory neurons

a. release neurotransmitters.
b. release hormones.
c. are unable to conduct action potentials, unlike ordinary neurons.
d. Both release neurotransmitters and are unable to conduct action potentials, unlike ordinary neurons.
e. Both release hormones and are unable to conduct action potentials, unlike ordinary neurons.

____ 3. The specificity of hormones is due to

a. specialized hormone secretion.
b. molecular rearrangement at the site of action.
c. specific binding of hormones to plasma proteins.
d. specialization of target-cell receptors.
e. discrete inactivation of hormones by the liver or kidneys.

____ 4. Hormones

a. are all of similar chemical composition.
b. combine with specific receptors on the target cell's surface or inside the target cell.
c. are secreted at a constant rate.
d. all act by activating adenylate cyclase, which transforms ATP into cyclic AMP.
e. All of these answers.

____ 5. All hormones

a. are regulated by the hypothalamus.
b. initiate synthesis of new proteins.
c. are secreted by endocrine glands through ducts into the blood.
d. must combine with specific receptors on the target cells in order to exert their effects.
e. are produced in a gland and target cells in different tissues.

____ 6. Which of the following is true about hormones?

a. are released from exocrine glands.
b. interact with receptors at target-cell sites.
c. are synthesized in the lymph nodes.
d. interact with receptors in the blood.

e. are all similar chemically.

____ 7. Which of the following statements concerning hormones is incorrect?
a. a single endocrine gland may produce multiple hormones.
b. a single target cell may be influenced by more than one hormone.
c. a single hormone can influence only one type of target cell.
d. an endocrine organ may exert nonendocrine functions in addition to secreting hormones.
e. the same hormone may be secreted by more than one endocrine gland.

____ 8. Select the incorrect statement about peptide hormones.
a. they include adrenal cortex hormones.
b. insulin is an example.
c. they are stored within secretory granules in the cell.
d. they are secreted from endocrine glands.
e. they must bind to membrane receptors to invoke their actions..

____ 9. Which statement regarding tropic hormones is incorrect?
a. they may stimulate the secretion of other hormones.
b. they target other glands.
c. they are all produced in the anterior pituitary.
d. Both (a) and (b) above.
e. All these answers.

____ 10. Which of the following is not a function of the endocrine system?
a. maintenance of blood sugar levels.
b. regulation of metabolic activity and H_2O and electrolyte balance.
c. promotion of growth and development
d. transduction of external stimuli.
e. helping the body cope with stressful situations.

____ 11. Which of the following is not controlled at least in part by hormones?
a. homeostasis.
b. organic metabolism.
c. rapid interactions with the external environment.
d. H_2O and electrolyte balance.
e. adaptation to stress.

____ 12. Tropic hormones
a. are produced by the posterior pituitary.
b. are secreted only by the hypothalamus.
c. primarily regulate hormone secretion by certain other endocrine glands.
d. all have nontropic functions, too.
e. are the hormones that stimulate athletes to win trophies.

____ 13. Hormones are classified into the following three types:
a. amines, peptides, and steroids.
b. amines, steroids, and phospholipids
c. amines, phospholipids, and steroids.
d. amines, free fatty acids, and peptides.
e. free fatty acids, peptides, and steroids.

____ 14. Amines
a. consist of a chain of specific amino acids of varying length.
b. are derived from the amino acid tyrosine.
c. include the hormones secreted by the thyroid gland and adrenal medulla.
d. Both (a) and (c) above.
e. All of these answers.

____ 15. Which of the classes of hormones are polar and, accordingly, hydrophilic and lipophobic?
a. peptides
b. catecholamines
c. steroids

d. Both peptides and catecholamines are correct.
e. All of these answers.

Questions 1-4: (A) Saliva (B) Gastric Secretions (C) Pancreatic secretions (D) Bile (E) Faeces : Match each numbered description with the correct gastrointestinal (GI) secretory products.

Has a component that is required for the intestinal absorption of Vit B_{12}.

(11) Is hypotonic, has a high [HCO_3^-], and its production is inhibited by vagotomy.

(1) Stimulated by secretin and contains the enzymes necessary for fat digestion

(2) Inhibited when the pH of the stomach contents is 1.0.

(3) Slow wave is small intestinal smooth muscle cells are: (A) Action Potentials (B) Phasic contractions (C) Tonic Contractions (D) Oscillating resting membrane potential (E) Oscillating release of Cholecystokinin (CCK)

(4) When parietal Cells are stimulated, they secrete: (A) HCl and intrinsic factors (B) HCl and pepsinogen (C) HCl and HCO_3^- (D) HCO_3^-, and intrinsic factors (E) Mucus and pepsinogen.

(5) Secretion of HCl by gastric parietal cells is needed for: (A) Activation of pancreatic lipase (B) Activation of salivary lipase (C) Activation of intrinsic factors (D) Activation of pepsinogen to pepsin (E) the formation of micelles.

(6) *Vibrio cholerae* causes diarrhoea because it: (A) increases HCO_3^-, secretory channels in the intestinal epithelial cells (B) increases Cl^- secretory channels in crypt cells (C) prevents the absorption of glucose and causes water to be retained in the intestinal lumen isoosmotically (D) inhibits cyclic adenosine monophosphate (cAMP) production in the intestinal epithelial cells (E) inhibits inositol 1,4,5-triphosphate (IP_3) production in intestinal epithelial cells.

(7) Cholecystokinin (CCK) has some gastric-like properties because both CCK and gastrin: (A) are released from G cells in the stomach (B) are released from I cells in the duodenum (C) are members of the secretin-homologous family (D) have five identical C-terminal amino acids (E) have 90% homology of their amino acids.

(8) A patient with severe Crohn's disease has been unresponsive to drug therapy and undergoes ileal resection. After the surgery, he will have steatorrhoea because: (A) the liver bile acid pool increases (B) chylomicrons do not form in the intestinal lumen (C) dietary triglycerides cannot be digested (E) the pancreas does not secrete lipase

(9) Cholecystokinin (CCK) inhibits (A) gastric emptying (B) pancreatic HCO_3^-, secretion (C) pancreatic enzyme secretion (D) contraction of gallbladder (E)relaxation of the sphincter of Oddi

(10) Which of the following abolishes the receptive relaxation of the stomach? (A) Parasympathetic stimulation (B) Sympathetic stimulation (C) Vagotomy (D) Administration of gastrin (E) Administration of vasoactive intestinal peptide (VIP)

(11) Peristalsis of the small intestine: (A) mixes the food bolus (B) is coordinated by the central nervous system (CNS) (C) involves contraction of smooth muscle behind and in front of the food bolus (D)involves contraction of smooth muscle behind the food bolus and relaxation of smooth muscle in front of the bolus (E) involves relaxation of smooth muscle throughout the small intestine.

(12) Which of the following is characteristic of saliva? (A) Hypotonicity relative to plasma (B) A lower HCO_3^-, concentration than plasma (C) the secretion rate

that is increased by vagotomy (D) The presence of proteases (E) Modification by the salivary ductal cells involves reabsorption of K^+ and HCO_3^-,

(13) A patient with duodenal ulcer is treated successfully with the drug cimetidine. The basis for cimetidine's inhibition of gastric H^+ secretion is that it (A) blocks muscarinic receptors on parietal cells (B) blocks H_2 receptors on parietal cells (C) increases intracellular cyclic adenosine monophosphate (cAMP) levels (D) Blocks H+, H^+-adenosine triphosphate (ATPase) (E) enhances the action of acetylcholine (ACh) on parietal cells.

(14) Which of the following is true about the secretion from the exocrine pancreas? (A) It has a higher C^{l-} concentration than does the duodenum (B) It is stimulated by the presence of HCO_3^-, in the duodenum (C) Pancreatic HCO_3^-, secretion is increased by gastrin (D) Pancreatic enzyme secretion is increased by cholecystokinin (CCK) (E) It is hpotonic

Questions 17-20: (A) Secretin (B) Gastrin (C) Cholecystokinin (CCK) (D) Vasoactive Intestinal Peptide (VIP) (E) Gastric inhibitory peptide (GIP) : Match each numbered characteristic with the appropriate gastrointestinal (GI) hormone.

(15) Released from neurons in the GI tract and produces smooth muscle relaxation

(16) Low pH inhibits it release

(17) Low pH stimulates its release

(18) Secreted in response an oral glucose load

Questions 21-23: (A) Gastric antrum (B) Gastric fundus (C) Duodenum (D) Ileum (E) Colon: Match each numbered phenomenon with the correct portion of the gastrointestinal (GI) tract.

(19) Secretion of instrinsic factor

(20) Secretion of K^+

(21) Secretion of gastrin

Good Luck

Dr. Salah/ Dr. Weledji