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UNIVERSITY EXAMINATIONS 2024/2025

SECOND YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN CLINICAL MEDICINE AND COMMUNITY HEALTH

CCM 3211: HUMAN PHYSIOLOGY II

DATE: JANUARY 2025 **TIME: 3 HOURS**

INSTRUCTIONS: *Answer all questions in the booklet provided*

Ensure that all your answers are properly numbered

Section A: Short Answer Questions

Section B: Long Answer Questions

Section C: Multiple Choice Questions (MCQs)

SECTION A: SHORT ANSWER QUESTIONS (EACH IS 5 MARKS)

1. Describe the swallowing reflex (5 Marks)
2. With reference to the mode of action of proton pump inhibitors, describe the mechanisms of hydrochloric acid secretion by the parietal cell (5 Marks)
3. Describe the steps in sensory transduction (5 Marks)
4. Describe the physiological effects of growth hormone (5 Marks)
5. Describe the regulation of thyroid hormone secretion and one clinical correlate (5 Marks)
6. Describe the digestion and absorption of lipids (5 Marks)

SECTION B: LONG ANSWER QUESTIONS (EACH IS 20 MARKS)

1. Discuss the pain pathway (20 Marks)
2. Describe the factors that regulate insulin secretion (20 Marks)

SECTION C: MULTIPLE CHOICE QUESTIONS (EACH IS 1 MARK)

1. Which of the following substances is released from neurons in the GI tract and produces smooth muscle relaxation?
   A. Secretin
   B. Gastrin
   C. Cholecystokinin (CCK)
   D. Vasoactive intestinal peptide (VIP)
   E. Gastric inhibitory peptide (GIP)
2. Which of the following is the site of secretion of intrinsic factor?
   A. Gastric antrum
   B. Gastric fundus
   C. Duodenum
   D. Ileum
   E. Colon
3. Vibrio cholerae causes diarrhea because it
   A. increases bicarbonate ions secretory channels in intestinal epithelial cells
   B. increases Chloride ions secretory channels in crypt cells
   C. prevents the absorption of glucose and causes water to be retained in the intestinal lumen isosmotically
   D. inhibits cyclic adenosine monophosphate (cAMP) production in intestinal epithelial cells
   E. inhibits inositol 1,4,5-triphosphate (IP3) production in intestinal epithelial cells
4. Cholecystokinin (CCK) has some gastrin-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

5. Which of the following is transported in intestinal epithelial cells by a Na+-dependent cotransport process?

   A. Fatty acids

   B. Triglycerides

   C. Fructose

   D. Alanine

   E. Oligopeptides

6. A 49-year-old male patient with severe Crohn's disease has been unresponsive to drug therapy and undergoes ileal resection. After the surgery, he will have steatorrhea because

   A. the liver bile acid pool increases

   B. chylomicrons do not form in the intestinal lumen

   C. micelles do not form in the intestinal lumen

   D. dietary triglycerides cannot be digested

   E. the pancreas does not secrete lipase

7. Secretion of which of the following substances is inhibited by low pH?

   A. Secretin

   B. Gastrin

   C. Cholecystokinin (CCK)

   D. Vasoactive intestinal peptide (VIP)

   E. Gastric inhibitory peptide (GIP)

8. A 38-year-old man who has galactorrhea is found to have a prolactinoma. His physician L) treats him with bromocriptine, whichneliminates the galactorrhea. The basis for the therapeutic action of bromocriptine is that it

   A. antagonizes the action of prolactin on the breast

   B. enhances the action of prolactin on the breast

   C. inhibits prolactin release from the anterior pituitary

   D. inhibits prolactin release from the hypothalamus

   E. enhances the action of dopamine on the anterior pituitary

9. Which of the following inhibits the secretion of growth hormone by the anterior pituitary?
   A. Sleep
   B. Stress
   C. Puberty
   D. Somatomedins
   E. Starvation
10. Selective destruction of the zona glomerulosa of the adrenal cortex would produce a deficiency of which hormone?
   A. Aldosterone
   B. Androstenedione
   C. Cortisol
   D. Dehydroepiandrosterone
   E. Testosterone
11. Which of the following causes increased aldosterone secretion?
   A. Decreased blood volume
   B. Administration of an inhibitor of angiotensin-converting enzyme (ACE)
   C. Hyperosmolarity
   D. Hypokalemia
   E. Hypocalcaemia
12. Secretion of oxytocin is increased by
   A. milk ejection
   B. dilation of the cervix
   C. increased prolactin levels
   D. increased extracellular fluid (ECF) volume
   E. increased serum osmolarity
13. A 39-year-old man with untreated diabetes mellitus type I is brought to the emergency room. An injection of insulin would be expected to cause an increase in his
   A. urine glucose concentration
   B. blood glucose concentration
   C. blood K+ concentration

D. blood pH

E. breathing rate

14. Which of the following would be expected in a patient with Graves' disease?

A. Cold sensitivity

B. Weight gain

C. Decreased 02 consumption

D. Decreased cardiac output

E. Increased thyroid-stimulating hormone (TSH) levels

15. Complete transection of the spinal cord at the level of Tl would most likely result in

A. temporary loss of stretch reflexes below the lesion

B. temporary loss of conscious proprioception below the lesion

C. permanent loss of voluntary control of movement above the lesion

D. permanent loss of consciousness above the lesion

E. complete denervation of the diaphragm

16. Sensory receptor potentials

A. are action potentials

B. always bring the membrane potential of a receptor cell toward threshold

C. always bring the membrane potential of a receptor cell away from threshold

D. are graded in size, depending on stimulus intensity

E. are all-or-none

17. Which of the following responses occurs as a result of tapping on the patellar tendon?

A. Stimulation of 1b afferent fibers in the muscle spindle

B. Inhibition of la afferent fibers in the muscle spindle

C. Relaxation of the quadriceps muscle

D. Contraction of the quadriceps muscle

E. Inhibition of a-motoneurons

18. Which gastrointestinal secretion is inhibited when the pH of the stomach contents is 1.0?

A. Saliva

B. Gastric secretion

C. Pancreatic secretion

D. Bile

E. Esophageal secretions

19. Which of the following would be expected to increase after surgical removal of the duodenum?

A. Gastric emptying

B. Secretion of cholecystokinin (CCK)

C. Secretion of secretin

D. Contraction of the gallbladder

E. Absorption of lipids

20. Which of the following hormones causes contraction of vascular smooth muscle?

A. Antidiuretic hormone (ADH)

B. Aldosterone

C. Atrial natriuretic peptide (ANP)

D. 1,25-Dihydroxycholecalciferol

E. Parathyroid hormone (PTH)