



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2022/2023 ACADEMIC YEAR

FIRST YEAR, SECOND TRIMESTER EXAMINATIONS

FOR THE DEGREE

OF

BACHELOR OF SCIENCE IN CLINICAL MEDICINE

COURSE CODE: HCP 102

COURSE TITLE: MEDICAL PHYSIOLOGY II

DATE: MONDAY 17TH APRIL 2023

TIME: 8:00-10:00 AM

INSTRUCTIONS TO CANDIDATES

Answer all Questions

Sec A: Multiple Choice Questions (MCQ) 20 Marks

Sec B: Short Answer Questions (SAQ) (40 marks)

Sec C: Long Answer Questions (LAQ) (40 marks)

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 5 Printed Pages. Please Turn Over.

SECTION A: SHORT ANSWER QUESTIONS

20 MARKS

1. The Secretin hormone:
 - A. Is secreted by the pancreas.
 - B. Is released by the pyloric mucosa.
 - C. Contracts the gall bladder wall.
 - D. Increases the pancreatic Secretion of water and HCO_3^- .
2. Inhibition of the myenteric plexus leads to which of the following?
 - A. Increased Secretion of Secretin from the duodenum.
 - B. Decreased gut motility.
 - C. Hyperacidity in the stomach.
 - D. Diarrhea.
3. Stimulation of sub mucosal plexus result in an Increase in which of the following?
 - A. Motility of the gut.
 - B. Secretion of the gut.
 - C. Sphincter tone.
 - D. Stomach ph.
4. Secretin:
 - A. Is a GIT hormone Secreted from the pylorus.
 - B. Is secreted as a result of vagus nerve stimulation.
 - C. Stimulates gastric Secretion.
 - D. Is released as a result of contact of acid chyme to the duodenal mucosa.
5. About the GIT hormones affecting gastric function:
 - A. CCK and Secretin Increase both gastric Secretion and motility.
 - B. gastrin Secretion is Stimulated by the digestive products of fat.
 - C. gastrin inhibits gastric Secretion and delay gastric emptying.
 - D. GIP and VIP inhibit gastric Secretion.
6. About Cholecystokinin-pancreozymin(CCK), all the following are true except:
 - A. It is GIT hormone secreted by the duodenal mucosa in response to presence of fat or protein digestive products.
 - B. It causes contraction of the gall bladder wall being a natural cholagogue.
 - C. It potentiates the action of secretion on the pancreas.
 - D. It inhibit both gastric and intestinal motility.
7. Mastication is important because:
 - A. Allows the salivary enzymes to act for a longer time.
 - B. Increase the surface area of the food particles.
 - C. Destroys the protective coating present around some foods.
 - D. All of the above.
8. During the chewing of a bolus of food, before Swallowing, salivary secretion, gastric secretion and pancreatic secretion are stimulated by which the following?
 - A. Acetylcholine, gastrin, histamine.

- B. Acetylcholine, CCK, nitric oxide.
 - C. Nitric oxide, VIP, histamine.
 - D. VIP, gastrin, Somatostatin.
9. The stomach is a poor area for absorption primarily because:
- A. Most foods are swallowed before ptyalin has a chance to breakdown starch
 - B. pH of the stomach is too high
 - C. The junction between epithelial cells presents wide space for fluid/ion movement
 - D. The stomach lacks villous membranes.
10. The enterogastric reflex can be elicited by which of the following?:
- A. Distension of the duodenum
 - B. Acid chyme in the duodenum.
 - C. Hyperosmotic chyme in the duodenum.
 - D. All of the above
11. Which of the following changes tends to increase GFR?
- A. Increased afferent arteriolar resistance
 - B. Decreased efferent arteriolar resistance
 - C. Increased glomerular capillary filtration coefficient
 - D. Increased Bowman's capsule hydrostatic pressure
12. In acidosis, most of the hydrogen ions secreted by the proximal tubule are associated with which of the following processes?
- A. Excretion of hydrogen ions
 - B. Excretion of NH_4^+
 - C. Reabsorption of bicarbonate ions
 - D. Reabsorption of phosphate ions
13. Which of the following changes, compared with normal, would be expected to occur, under steady state conditions, in a patient whose severe renal disease has reduced the number of functional nephrons to 25% of normal?
- A. Increased GFR of the surviving nephrons
 - B. Decreased urinary creatinine excretion rate
 - C. Decreased urine flow rate in the surviving nephrons
 - D. Decreased urinary excretion of sodium
14. Which of the following changes would you expect to find in a dehydrated person deprived of water for 24 hours?
- A. A) Decreased plasma renin activity
 - B. B) Decreased plasma antidiuretic hormone concentration
 - C. C) Increased plasma atrial natriuretic peptide concentration
 - D. D) Increased water permeability of the collecting duct
15. Which of the following is true of the tubular fluid that passes through the lumen of the early distal tubule in the region of the macula densa?
- A. It is usually isotonic

- B. It is usually hypotonic
 - C. It is usually hypertonic
 - D. It is hypertonic in antidiuresis
16. Which of the following statements is correct?
- A. Urea reabsorption in the medullary collecting tubule is less than in the distal convoluted tubule during antidiuresis
 - B. Urea concentration in the interstitial fluid of the renal cortex is greater than in the interstitial fluid of the renal medulla during antidiuresis
 - C. The thick ascending limb of the loop of Henle reabsorbs more urea than the inner medullary collecting tubule during antidiuresis
 - D. Urea reabsorption in the proximal tubule is greater than in the cortical collecting tubule
17. A healthy 29-year-old man runs a 10-km race on a hot day and becomes very dehydrated. Assuming that his antidiuretic hormone levels are very high, in which part of the renal tubule is the most water reabsorbed?
- A. Proximal tubule
 - B. Loop of Henle
 - C. Distal tubule
 - D. Cortical collecting tubule
18. Which of the following nephron segments is the primary site of magnesium reabsorption under normal conditions?
- A. Proximal tubule
 - B. Descending limb of the loop of Henle
 - C. Ascending limb of the loop of Henle
 - D. Distal convoluted tubule
19. Which of the following statements is true?
- A. Antidiuretic hormone (ADH) increases water reabsorption from the ascending loop of Henle
 - B. Water reabsorption from the descending loop of Henle is normally less than that from the ascending loop of Henle
 - C. Sodium reabsorption from the ascending loop of Henle is normally less than that from the descending loop of Henle
 - D. Osmolarity of fluid in the early distal tubule would be less than 300 mOsm/L in a dehydrated person with normal kidneys and increased ADH levels
20. Which of the following changes tends to increase urinary Ca^{++} excretion?
- A. A) Extracellular fluid volume expansion
 - B. B) Increased plasma parathyroid hormone concentration
 - C. C) Decreased blood pressure
 - D. D) Increased plasma phosphate concentration

SECTION B: SHORT ANSWER QUESTIONS

40 MARKS

1. Discuss physiological changes that takes place when Myenteric plexus is stimulated
5 Marks
2. Explain the roles/actions of neurotransmitter Ach secreted by enteric neurons in GIT
5 marks
3. Briefly explain stepwise how pepsinogen is secreted
5 marks
4. Discuss how carbohydrates are absorbed in GIT
5 marks
5. Discuss the ultrafiltration process that takes place in the nephrons
5 marks
6. Giving examples discuss the role of hormones in regulating tubular reabsorption in the nephron
5 marks
7. Formation of concentrated urine is one of the complex processes that takes place in the kidneys. Explain
5 marks
8. Discuss the pressures that determine the GFR
5 marks

SECTION C: LONG ANSWER QUESTION

40 MARKS

1. Giving details discuss the gastrointestinal motility process in steps
20 Marks
2. For the kidneys to have a constant normal GFR, renal autoregulation of blood flow takes place. Discuss how this process is achieved
20 marks