



(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/HPT 124**

**COURSE TITLE: MEDICAL PHYSIOLOGY II**

**DATE: MONDAY 17<sup>TH</sup> APRIL 2023**

**TIME : 8:00-10:00 AM**

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**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 4 Printed Pages. Please Turn Over.**

SECTION A: SHORT ANSWER QUESTIONS

20 MARKS

**1. Function of the stomach include the following, EXCEPT:**

- A. Storage of food during digestion.
- B. Secretion of intrinsic hemopoietic factor into the lumen.
- C. Secretion of secretin into the blood.
- D. The maintenance of iron in the ferrous state.

**2. Gastric emptying:**

- A. Is slowest if the food is soft and rich in carbohydrates.
- B. Is inhibited by excessive acidity in the duodenum.
- C. Is accelerated by presence of fat or hypertonic solutions in the duodenum.
- D. Is delayed by distension of the stomach and by vagal stimulation.

**3. HCL secretion includes all the following processes EXCEPT:**

- A. Active transport of  $H^+$  into the gastric lumen.
- B.  $H^+$  is exchanged for  $K^+$  from the extracellular fluid.
- C.  $HCO_3^-$  diffuses into the extracellular fluid in exchange for  $Cl^-$ .
- D. It is associated with production of postprandial alkaline tide.

**4. The cephalic phase of gastric secretion:**

- A. Occurs when food reaches the stomach.
- B. Is not accompanied by release of GRP (gastrin-releasing peptide).
- C. Is controlled by the vagi nerves.
- D. Is not blocked by injection of atropine.

**5. Secretin:**

- A. Acts as a powerful cholagogue.
- 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.

**6. The pancreatic secretion:**

- A. Is the primary source of  $HCO_3^-$  for neutralization of HCl in the intestine.
- B. Is secreted by the pancreatic acini only.
- C. Is the least important digestive juice.
- D. Is associated with rise of the blood pH.

**7. Concerning bile and bile salts, all are true EXCEPT:**

- A. Bile salts are emulsifying agents.
- B. Bile are concentrated in the gall bladder.
- C. Bile salts promote lipid absorption by forming water soluble micells.
- D. Its secretion from the liver is intermittent

**8. The peristalsis in the small intestine:**

- A. Can occur in absence of the local nerve plexus.
- B. Is myogenic in origin.
- C. Plays a minimal role in food propulsion.
- D. Is commonly reversed (antiperistalsis) in the duodenum & lower ileum.

**9. Concerning large intestine:**

- A. It contains villi for absorption.
- B. Distention of proximal colon initiates defecation.
- C. Ammonia can be formed from bacteria.
- D. Digestion of cellulose occurs in human.

**10. Defecation:**

- A. It is under voluntary control in infants.
- B. During rest, the rectum is distended.
- C. It is delayed by gastric colic reflex.
- D. It occurs more likely just after meals

**11. The ileum is the principle site for the absorption of:**

- A. The products of fat digestion.
- B. Bile salts.
- C. Vitamin K.
- D. Iron.

**12. The ascending limb of the Loop of Henle is:**

- A. Impermeable to  $\text{Na}^+$
- B. Involved in active transport of  $\text{K}^+$  into the lumen
- C. Involved in active transport of  $\text{Cl}^-$  out of lumen
- D. Involved in active transport of  $\text{Na}^+$  into lumen

**13. Regarding glucose handling in the kidney**

- A. Reuptake is passive
- B.  $T_m$  is the same for all nephrons
- C. D-glucose more rapidly absorbed than L-glucose
- D. Reabsorption is inversely proportional to lipid solubility

**14. Which ONE of the following is not involved in the regulation of glomerular filtration rate (GFR)?**

- A. Juxtaglomerular apparatus
- B. Arterial pressure
- C. Efferent arteriolar tone
- D. Afferent arteriolar tone

**15. Increased GFR is caused by**

- A. Increased cardiac output
- B. Afferent arteriolar vasoconstriction
- C. Efferent arteriolar vasodilatation
- D. Increased chloride delivery to the macula densa

**16. Which of the following is involved in the regulation of glomerular filtration rate (GFR)?**

- A. Juxtaglomerular apparatus
- B. Afferent arteriolar tone
- C. Efferent arteriolar tone
- D. All of the above

**17. Angiotensin II causes:**

- A. Increases proximal tubular reabsorption of Na & H<sub>2</sub>O & increases secretion of K<sup>+</sup>
- B. Increases distal tubular reabsorption of Na & H<sub>2</sub>O & decreases secretion of K<sup>+</sup>
- C. Decreases distal tubular reabsorption of Na & H<sub>2</sub>O
- D. Increases excretion of Na & H<sub>2</sub>O

**18. Renal nerve sympathetic stimulation**

- A. Causes increased sodium reabsorption from the PCT
- B. Inhibits renin release
- C. Increased GFR
- D. Lowers efferent arterial tone

**19. Glomerular filtration rate (GFR):**

- A. Is independent of the size of the capillary bed
- B. Depends only on the hydrostatic and osmotic pressure differences across the capillary
- C. Is determined by the same forces governing filtration across all other capillaries
- D. Depends only on the permeability of the capillary

**20. Glycosuria is most likely to occur with:**

- A. increased GFR and increased blood glucose level
- B. decreased GFR and increased blood glucose level
- C. decreased GFR and decreased blood glucose level
- D. increased GFR and decreased blood glucose level

**SECTION B: SHORT ANSWER QUESTIONS**

**40 MARKS**

- |                                                                                      |         |
|--------------------------------------------------------------------------------------|---------|
| 1. Discuss the factors that make the GIT membrane more excitable(Depolarize)         | 5 marks |
| 2. Explain the secretions in the large intestines, their stimuli and their functions | 5 marks |
| 3. Discuss the absorption of carbohydrates in GIT system                             | 5 marks |
| 4. Discuss the motility of food in esophagus                                         | 5 marks |
| 5. Explain the ultrafiltration process in the glomerular capillaries                 | 5 marks |
| 6. Discuss the pressures that determine the glomerular filtration rate               | 5 marks |
| 7. Name and explain the action of five hormones regulating the tubular reabsorption  | 5 marks |
| 8. Explain the formation of dilute urine physiologically                             | 5 marks |

**SECTION C: LONG ANSWER QUESTIONS**

**40 MARKS**

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|-----------------------------------------------------------------------------------------------------|----------|
| 1. With the help of a diagram discuss the electrical activity of the gastrointestinal smooth muscle | 20 marks |
| 2. Discuss the regulation of blood pressure by renin-angiotensin in the kidney                      | 20 marks |