



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT OF HEALTH SCIENCES

QUALIFICATION : BACHELOR OF HUMAN NUTRITION	
QUALIFICATION CODE: 08BOHN	LEVEL: 5
COURSE NAME: GASTROINTESTINAL AND ENDOCRINE PHYSIOLOGY	COURSE CODE: GEP521S
SESSION: JANUARY 2023	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SUPPLEMENTARY/SECOND OPPORTUNITY QUESTION PAPER	
EXAMINER:	MS RIANA PICK
MODERATOR:	DR ELZABE VAN DER COLF

INSTRUCTIONS	
<ol style="list-style-type: none">1. Answer ALL the questions in the answer book provided.2. Write clearly and neatly.3. Number the answers clearly.	

PERMISSIBLE MATERIALS

NONE

THIS QUESTION PAPER CONSISTS OF 10 PAGES (Including this front page)

SECTION A

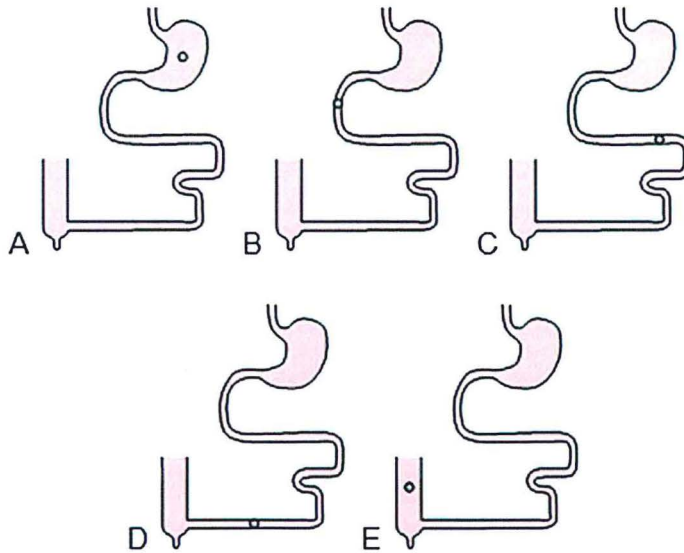
QUESTION 1

(20 MARKS)

Evaluate the following statements in each numbered section and select the most appropriate answer from the given possibilities. Write the appropriate letter next to the number of the statement/phase in the ANSWER BOOK. (Each question carries 1 mark.)

- 1.1 A 23-year-old man consumes a meal containing 30 percent protein, 15 percent fat, and 55 percent carbohydrate. At which of the locations depicted in the below figure are bile salts most likely to be absorbed by an active transport process:

- A) A
- B) B
- C) C
- D) D
- E) E



- 1.2 Which ion has the highest concentration in saliva under basal conditions:

- A) Bicarbonate
- B) Chloride
- C) Potassium
- D) Sodium

1.3 The proenzyme pepsinogen is secreted mainly from which of the following structures:

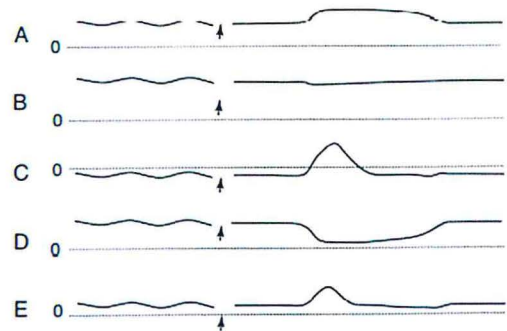
- A) Acinar cells of the pancreas
- B) Ductal cells of the pancreas
- C) Epithelial cells of the duodenum
- D) Gastric glands of the stomach

1.4 Which hormone is released by the presence of fat and protein in the small intestine and has a major effect in decreasing gastric emptying:

- A) CCK
- B) GLIP
- C) Gastrin
- D) Motilin
- E) Secretin

1.5 Which manometric recording in the below figure illustrates normal function of the oesophagus at midthoracic level before and after swallowing (indicated by the arrow): The dotted lines represent a pressure of 0 mm Hg.

- A) A
- B) B
- C) C
- D) D
- E) E



1.6 A 62-year-old man with dyspepsia and a history of chronic gastric ulcer has abdominal pain, with his endoscopy showing a large ulcer in the proximal gastric body and biopsies positive for *H. pylori*. Which substances are used clinically for treatment of gastric ulcers of various aetiologies:

	<u>Antibiotics</u>	<u>NSAIDs</u>	<u>H₂ Blockers</u>	<u>Proton Pump Inhibitors</u>
A)	No	No	Yes	Yes
B)	Yes	No	No	Yes
C)	Yes	No	Yes	Yes
D)	Yes	Yes	Yes	Yes
E)	No	Yes	Yes	Yes

1.7 Cystic fibrosis (CF) is an inherited disorder of the exocrine glands affecting children and young people. A primary disruption in the transfer of which ion across cell membranes occurs in CF, leading to decreased secretion of fluid:

- A) Calcium
- B) Chloride
- C) Phosphate
- D) Potassium
- E) Sodium

1.8 A 45-year-old woman with type 1 diabetes has an early feeling of fullness when eating, often nauseous after a meal and vomits about once each week after eating. Glucose-induced damage to which structure is most likely to explain her gastrointestinal problem:

- A) Celiac ganglia
- B) Enteric nervous system
- C) Oesophagus
- D) Stomach
- E) Vagus nerve

- 1.9 An 89-year-old man has a cerebrovascular accident (stroke) in the medulla and pons that completely eliminates all vagal output to the gastrointestinal tract. Which function is most likely to be totally eliminated in this man:
- A) Gastric acid secretion
 - B) Gastrin release
 - C) Pancreatic bicarbonate secretion
 - D) Primary oesophageal peristalsis
 - E) Secondary oesophageal peristalsis
 - F) None of the above
- 1.10 Cystic Fibrosis (CF) is the most common cause of pancreatitis in children. Which option best explains the mechanism of CF-induced pancreatitis:
- A) Activation of enterokinase
 - B) Activation of trypsin inhibitor
 - C) Autodigestion of pancreas
 - D) Excessive secretion of CCK
 - E) Gallstone obstruction
- 1.11 Which of the following is both synthesized and stored in the hypothalamus:
- A) ADH
 - B) Thyroid-stimulating hormone (TSH)
 - C) LH
 - D) Somatostatin
 - E) Somatomedin
- 1.12 By which mechanism do LH and FSH return to baseline levels:
- A) LH surge
 - B) Negative feedback on gonadotropin-releasing hormone (GnRH) by progesterone
 - C) Negative feedback on GnRH by oestradiol
 - D) Negative feedback on GnRH from testosterone

Match each of the patients described in Questions 1.13 and 1.14 with the correct set of plasma values listed in the table below, considering normal values for: plasma aldosterone concentration, 10 ng/dl; plasma cortisol concentration, 10 mg/dl; and plasma potassium concentration, 4.5 mEq/L.

Aldosterone Concentration	Cortisol Concentration	Potassium Concentration
A) 10.0	2.0	4.5
B) 2.0	2.0	6.0
C) 40.0	30.0	2.0
D) 40.0	10.0	4.5
E) 40.0	10.0	2.0

- 1.13 A patient with Conn's syndrome
- 1.14 A patient consuming a low-sodium diet
- 1.15 A patient has an elevated plasma thyroxine (T4) concentration, a low plasma TSH concentration, and her thyroid gland is smaller than normal. What is the most likely explanation for these findings:
- A) A lesion in the anterior pituitary that prevents TSH secretion
 - B) The patient is taking propylthiouracil
 - C) The patient is taking thyroid extract
 - D) The patient is consuming large amounts of iodine
 - E) Graves' disease
- 1.16 A patient has nephrogenic diabetes insipidus. Of the following options, which outcome would be expected, or which intervention would be suggested:
- A) Expected outcome: decreased plasma sodium concentration
 - B) Expected outcome: increased secretion of ADH from the supraoptic and paraventricular nuclei
 - C) Expected outcome: high urine osmolality
 - D) Suggested intervention: water restriction
 - E) Suggested intervention: ADH antagonists (vaptans)

- 1.17 A patient presenting with tachycardia and heat intolerance, is suspected of having Graves' disease. Which of the following is not consistent with suspected diagnosis:
- A) Increased total and free T4
 - B) Suppressed plasma [TSH]
 - C) Exophthalmos
 - D) Goitre
 - E) Decreased thyroid radioactive iodine uptake
- 1.18 A 56-year-old woman who completed menopause 3 years ago is found to have low levels of FSH in her blood, when during the first few years after menopause, FSH levels are normally extremely high. What is the best explanation for this finding:
- A) She has been receiving hormone replacement therapy with oestrogen and progesterone since she completed menopause
 - B) Her adrenal glands continue to produce oestrogen
 - C) Her ovaries continue to secrete oestrogen
 - D) She took birth control pills for 20 years before menopause
- 1.19 A patient has hyperthyroidism due to a pituitary tumour. Which set of physiological changes would be expected:

<u>Thyroglobulin Synthesis</u>	<u>Heart Rate</u>	<u>Exophthalmos</u>
A) Increase	Increase	Positive
B) Increase	Increase	Negative
C) Increase	Decrease	Positive
D) Decrease	Decrease	Positive
E) Decrease	Decrease	Negative
F) Decrease	Increase	Negative

- 1.20 Which finding is most likely in a patient who has myxedema:
- A) Somnolence
 - B) Palpitations
 - C) Increased respiratory rate
 - D) Increased cardiac output
 - E) Weight loss

QUESTION 2

(20 MARKS)

Assess the following statements and decide whether they are **true or false**. Write only the number of the question and next to it indicate your answer as **true or false** in the ANSWER BOOK. *(Each question carries 1 mark)*

- 2.1 Squamous stratified epithelium lines the oral cavity.
- 2.2 Carbohydrates and minerals encompass the nutrients obtained from food.
- 2.3 'Peristalsis' is a voluntary muscle movement which moves food along the digestive tract.
- 2.4 Mostly mechanical digestion occurs in the mouth.
- 2.5 Chemical digestion occurs in the oesophagus.
- 2.6 Proportion and gastric juices differentiate 'chyme' from a 'bolus.'
- 2.7 Parietal (oxyntic) cells release intrinsic factor.
- 2.8 Intrinsic factor helps the gut absorb minerals.
- 2.9 The function of the peritoneum: Provide a protective, lubricating surface for abdominal organs.
- 2.10 The segments of the small intestine encompass the duodenum, ileum and colon.
- 2.11 The small endocrine gland located in the centre of the "brain" is known as the pineal gland.
- 2.12 The "beta" cells of the pancreas are responsible for the production of glucagon.
- 2.13 Secondary male characteristics are influenced by hormones known as "androgens."
- 2.14 The development of T-lymphocytes is regulated by hormones known as "mineralocorticoids."
- 2.15 The parathyroid hormone acts in a manner that is antagonistic to the activity of "calcitonin."

- 2.16 Both thyroxin and triiodothyronine increase the rate of "metabolism" in the body.
- 2.17 Contractions of the uterus may be stimulated by the hormone "vasopressin."
- 2.18 The hormone ACTH is produced by the "adrenal gland," and it regulates the activity of the adrenal cortex.
- 2.19 The follicle stimulating hormone is a product of the " posterior" pituitary gland that acts on the ovaries and testes.
- 2.20 Swelling of the thyroid glands due to a lack of iodine is referred to as "goitre."

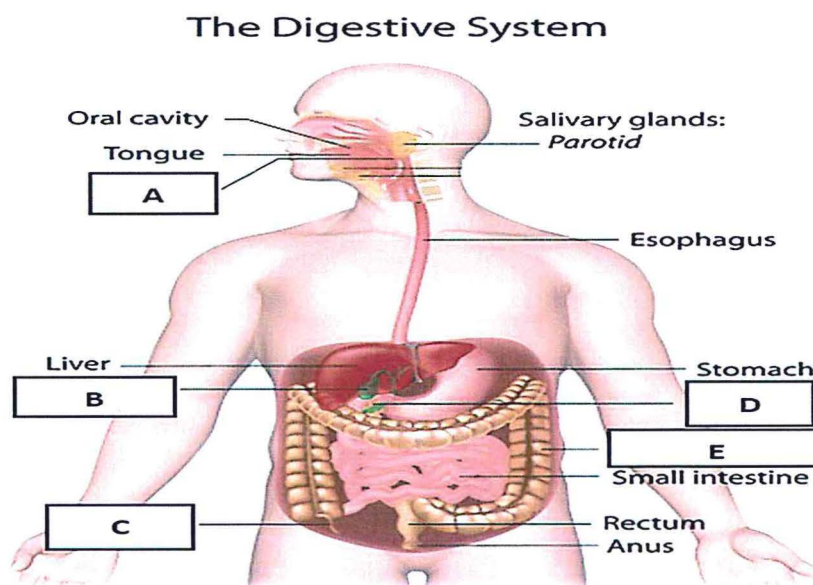
SECTION B

QUESTION 3

(22 MARKS)

- 3.1 Explain the following concept:
 - 3.1.1 Primary function of the endocrine system (2)

- 3.2 Using the anatomical figure below, name and state the function of organ: (10)



- 3.3 Complete the table below by naming the histological (structural) gastrointestinal layers 1-4 in order, and matching the correct function A, B, C, D, or E to each histological layer (10)

Layer	Functions
1....	A. Nourishes gut epithelium
2....	B. Layer of connective tissue that provides a structural network of blood vessels, nerve, ducts of exocrine glands
3....	C. Break up food, Mix food with digestive enzymes, Control gut motility
4....	D. Provides a microvasculature network which coordinates intestinal absorption & secretion
	E. Transports products of digestion

QUESTION 4

(18 MARKS)

- 4.1 Name the three mechanisms by which endocrine glands are stimulated to synthesize and release hormones? (3)
- 4.2 Name the five main types of cells which make up the Langerhans islets, and an example of a peptide hormone released by each of these cell types? (10)
- 4.3 Define '*dysphagia*'. What causes *dysphagia*? (5)

SECTION C

QUESTION 5

(20 MARKS)

- 5.1 Classify intestinal neoplasms? (3)
- 5.2 What are the clinical features of hypothyroidism? (5)
- 5.3 Describe the normal anatomy and functions of the pituitary, thyroid, parathyroid glands, and adrenals? (12)

GOOD LUCK!!!