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QUALIFICATION : **BACHELOR OF HUMAN NUTRITION**	
QUALIFICATION CODE: **08BOHN**	LEVEL: **5**
COURSE: **GASTROINTESTINAL AND ENDOCRINE PHYSIOLOGY**	COURSE CODE: **GEP521S**
DATE: **NOVEMBER 2024**	SESSION: **1**
DURATION: **3 HOURS**	MARKS: **100**

FIRST OPPORTUNITY EXAMINATION: QUESTION PAPER

EXAMINER: DR. PENEHAFO HAITAMBA-SHINDUME

MODERATOR: MR. GEORGE WALIOMUZIBU

INSTRUCTIONS:

1. Answer all questions on the separate answer sheet.
2. Please write neatly and legibly.
3. Do not use the left side margin of the exam paper. This must be allowed for the examiner.
4. No books, notes and other additional aids are allowed.
5. Mark all answers clearly with their respective question numbers.

PERMISSIBLE MATERIALS:

1. No Permissible material

This question paper consists of 7 pages including this front page

SECTION A: MULTIPLE CHOICE AND MATCHING QUESTIONS [20 MARKS]

QUESTION 1: MULTIPLE CHOICE QUESTIONS [10 MARKS]

Evaluate the statements/questions in each numbered section and select the most appropriate answer or phrase from the given possibilities. Fill in the appropriate letter next to the number of the correct statement/phrase on your ANSWER SHEET. [10]

1.1 Which layer of the digestive tract is in direct contact with the food that is consumed:

A) Mucosa
B) Muscularis
C) Serosa
D) Submucosa

1.2 The enteric plexus is found in the:

A) Submucosa layer
B) Muscularis layer
C) Serosa layer
D) Both a and b
E) All the above.

1.3 Which of the stomach cell types is not correctly matched with its function:

A) Surface mucosa cells: produce mucous.
B) Parietal cells: produce hydrochloric acid.
C) Chief cells: produce intrinsic factor.
D) Endocrine cells: produce regulatory hormones.

1.4 Given these parts of the small intestine:

1. Duodenum
2. Ileum
3. Jejunum

Choose the arrangement that lists the parts in the order how food encounters them as it passes through the small intestine.

A) 1,2,3
B) 1,3,2
C) 2,1,3
D) 2,3,1
E) 3,1,2

1.5 Which of these might occur if a person suffers from a severe case of hepatitis that impairs liver function:

A) Fat digestion is difficult.
B) By-products of haemoglobin breakdown accumulate in the blood.
C) Plasma proteins decrease in concentration.
D) Toxins in the blood increase.
E) All of the above.

1.6 Which of these occurs as a response to a thyroidectomy (removal of the thyroid gland):

A) Increased calcitonin secretion
B) Increased T3 and T4 secretion
C) Decreased TRH secretion
D) Increased TSH secretion

1.7 Oxytocin is responsible for:

A) Preventing milk release from the mammary glands.
B) Preventing goiter.
C) Causing contraction of the uterus.
D) Maintaining normal calcitonin levels.
E) Increasing metabolic rate.

1.8 LH and FSH:

A) Are produced in the hypothalamus.
B) Production is increased by TSH.
C) Promote the production of gametes and reproductive hormones:
D) Inhibit the production of prolactin
E) All of the above.

1.9 The adrenal medulla:

A) Produces steroids
B) Has cortisol as its major secretory product
C) Decreases its secretions during exercise
D) Is formed from a modified portion of the sympathetic ANS
E) All of the above.

1.10 Which of these hormones is not a hormone secreted into the hypothalamohypophysial portal system:

A) GHRH
B) TRH
C) PIH
D) GnRH

E) ACTH

QUESTION 2: MATCH EACH ANSWER **[10 MARKS]**

2.1 Match each endocrine gland with its germ layer origin. Write each answer on your sheet by listing the gland and next to it the germ layer origin: (One mark each) (5)

Endocrine Gland	Germ Layer
1. Gonads	a) Endoderm
2. Pineal gland	b) Mesoderm
3. Thyroid gland	c) Ectoderm
4. Adrenal cortex	
5. Pituitary gland (Posterior)	

2.2 Match each digestive juice with its enzyme, the substance it acts on, and the end product. One mark for a full correct answer. (5)

Digestive juice	Enzyme	Substance Produced	End Product
Saliva	Lipase	Fats	Amino acids
Gastric juice	Amylase	Proteins	Simple sugars
Pancreatic juice	Pepsin	Carbohydrates	Glycerol and Fatty acids
Bile	Trypsin		Smaller peptides
Intestinal juice	Bile salts		Glucose

SECTION B: SHORT/LONG ANSWER QUESTIONS **[80 MARKS]**

Please answer ALL the questions in this section.

QUESTION 3: **[20 MARKS]**

3.1 Propose 5 functions of the Liver. (5)

3.2 Describe the following reactions that take place during the phase 1 detoxification pathway in the liver:

a) Oxidation (2)

b) Hydrolysis (2)

3.3 Explain the 3 main functions of the enteric nervous system. (3)

3.4 Elaborate on 3 main functions of the microbiome in our gut. (6)

3.4 Discuss the following pathological diseases of the gastrointestinal tract: (2)

a) Hepatitis
b) Crohn's Disease

QUESTION 4: **[20 MARKS]**

4.1 Propose 5 functions of the endocrine system. (5)

4.2 List the 4 main chemical structures of hormones. (4)

4.3 What is the difference between a positive feedback loop and a negative feedback loop system? (2)

4.4 Mention all 8 Pituitary Hormones. (8)

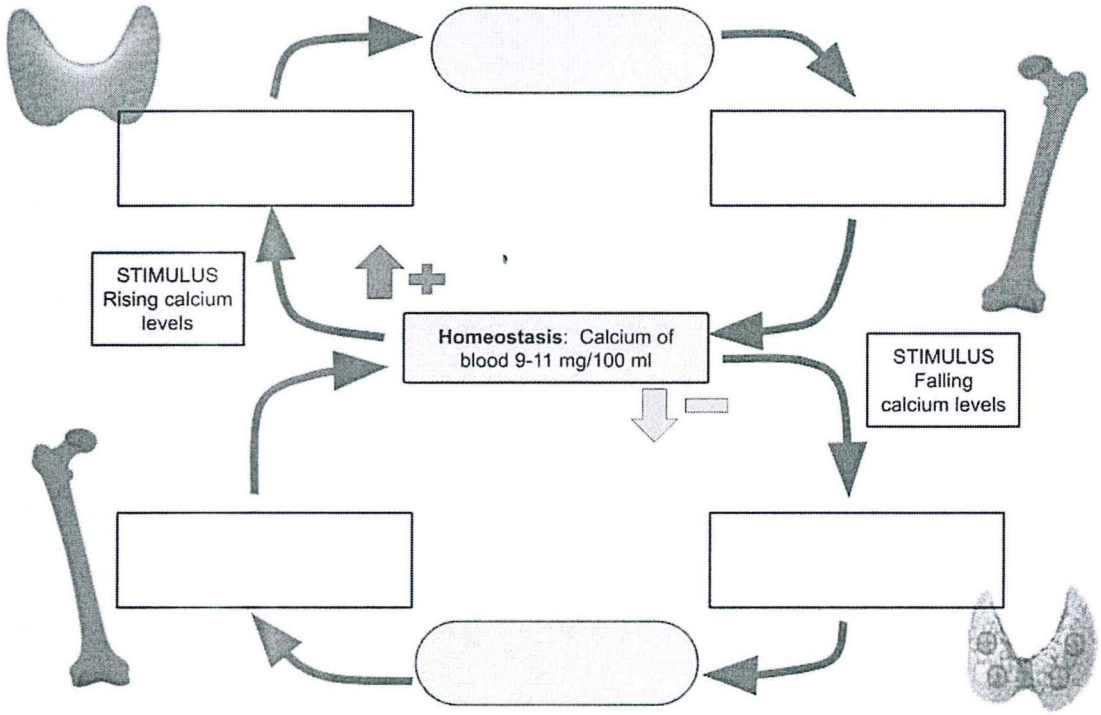
4.5 Which pancreatic cells produce the hormone insulin? (1)

QUESTION 5: **[10 MARKS]**

Draw the phase 1 and phase 2 liver detoxification flow chart listing all the major processes, enzymes and end products involved.

QUESTION 6: **[10 MARKS]**

1. Give the name of the following feedback loop. (2)
2. Is it a negative a or a positive feedback loop? (2)
3. Draw and label the empty spaces of the processes taking place within this feedback loop. (6)



QUESTION 7: **[10 MARKS]**

A 22-year-old NUST student, John, comes to the health centre complaining of diarrhoea that has lasted for three days. He reports having watery stools about six times a day and feeling fatigued. John mentions that he recently ate at a street vendor and has also experienced mild stomach cramps. He is worried about dehydration because he hasn't been drinking much water.

7.1 Based on John's symptoms and recent eating habits, what are some possible causes of his diarrhoea? (2)

7.2 Suggest signs of dehydration should John be aware of? Why is hydration important in this situation? (2)

7.3 Propose are some steps John can take to manage his diarrhoea and prevent dehydration? (2)

7.4 Under what circumstances should John consider seeing a doctor about his diarrhoea? (2)

7.5 What foods or fluids should John consume while recovering from diarrhoea? What should he avoid? (2)

QUESTION 8: Case Study **[10 MARKS]**

Maria is a 28-year-old woman who recently visited her doctor due to fatigue and increased thirst. She has noticed that she has been gaining weight over the past year, particularly around her abdomen. Maria's family has a history of type 2 diabetes. Her doctor performed blood tests that showed elevated fasting blood glucose levels and increased insulin levels, indicating insulin resistance.

8.1 Explain what insulin resistance means and how it affects blood sugar levels. (2)

8.2 Based on Maria's background and symptoms, what are some potential causes of her insulin resistance? (2)

8.3 Mention health risks are associated with insulin resistance, especially in relation to diabetes? (2)

8.4 Suggest lifestyle changes can Maria make to help manage her insulin resistance? (2)

8.5 How should Maria monitor her condition, and when should she consider following up with her doctor? (2)

END OF QUESTION PAPER