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Name:_____

Personal ID. No:_____

School of Health sciences

WRITTEN EXAMINATION

Course: Patophysiology and pharmacology

Examination: Written exam 2

Course code: BM544G

Credits for written examination: 3.5

Date: 2023-11-24

Examination time: 8:15-12:30

Examination responsible: Anna Benrick

Teachers concerned: Cathal O'Hare and Katarina Skogfält

Aid at the exam/appendices: No aids allowed

Other: **Write your answers directly in the exam. Use the back of the papers if you need more space.**

Instructions

- ☐ Take a new sheet of paper for each teacher.
- ☐ Take a new sheet of paper when starting a new question.
- ☐ Write only on one side of the paper.
- ☒ Write your name and personal ID No. on all pages you hand in.
- ☒ Use page numbering.
- ☒ Don´t use a red pen.
- ☒ Mark answered questions with a cross on the cover sheet.

Grade points: E ≥ 60%, D ≥ 68%, C ≥ 76%, B ≥ 84%, A ≥ 92%

Examination results should be made public within 18 working days

Good luck!

Total number of pages

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Patophysiology

1. In primary hypothyroidism, how are the levels of TSH, T3, and T4 and why? Describe two different underlying pathophysiology causes for the condition. (5p)

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2. Describe the pathophysiology of Graves' disease. How are the levels of TRH, TSH, T3, and T4 and why? (3p)

3. In the onset of type 1 diabetes, there is a risk of the individual exhibiting symptoms of ketoacidosis, a dangerous lethal condition if missed out or left untreated. Answer the following questions: (total 6p)

   A, Describe the pathophysiology of type 1 diabetes. (2p)

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B, Name three common symptoms of type 1 diabetes. (1.5)

C, Explain the pathophysiology of ketoacidosis. (2p)

D, Name one biomarker that can provide insights into whether ketoacidosis is occurring. (0.5p)

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4. Address the following aspects related to type 2 diabetes and insulin resistance: (total 4p)

A, Explain the concept of insulin resistance in the context of type 2 diabetes. (1.5p)

B, List four risk factors associated with the development of insulin resistance. (2p)

C, In addition to fasting blood glucose, give one example of another diagnostic test commonly used to assess long-term blood sugar control in individuals suspected of having type 2 diabetes? (0.5p)

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Pharmacology

1. Why can insulin not be administered orally? Give two reasons why this route of administration does not work. 2p

2. Name a currently available route of administration for insulin other than subcutaneous or intravenous injection. 1p

3. Describe the mechanism of action of sulfonylureas. 3p

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4. Why is the risk of hypoglycemia with biguanides (metformin) less than that with sulfonylureas? 1p

5. Explain how sodium–glucose cotransporter 2 inhibitors (SGLT2) can lower blood pressure? 2p

6. Describe the two proposed mechanisms by which glucagon-like peptide receptor agonists (GLP-1 agonists) cause weight loss? 2p

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7. Describe the mechanism of action of thiazolidinediones. 3p

8. State whether the following statements are true or false by putting a cross in the appropriate box. 1p

	True	False
Calcium preparations and aluminum-containing antacids can decrease the absorption of levothyroxine.		
Levothyroxine has a longer half-life than T3 preparations.		
In the cell, levothyroxine is enzymatically deiodinated to T3.		
Levothyroxine is dosed once weekly.		

9. State four adverse effects of levothyroxine. 2p

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10. The sites of action of which group of drugs are shown in the diagram below? 1p