UNIVERSITY OF SKÖVDE

Cover sheet with information to the invigilator

Name:_____

Personal ID number:_____

School of Health sciences

Course Pathophysiology and pharmacology

Examination: Written exam 1

Course code: BM544G

Credits for written examination: 4.5

Date: 2025-06-09

Examination time: 14:15-18:30

Available teacher: Cathal O'Hare

Available on phone number: 0760570313
Between 15:00-16:00

Visiting the examination ☐ Yes, at
☒ No

Aids and other information for invigilators

Calculator ☐ Provided by the University
☐ Student's own calculator
☒ Not allowed

Writing paper ☐ Lined
☐ Squared

If you copy the exam papers yourself, provide the number of copies

Instructions to examinations responsible

All examination documents are to be handed in at Reprocentralen.

- **For copying of examination papers** the originals must be handed in no later than 6 workdays before the examination. The number of copies is filled in by Reprocentralen in the field below.
- **Copied examination papers** must be handed in no later than 3 workdays before the examination. Please notify the examination administration in due time when the papers will be handed in. Examination papers are to be handed over directly to the staff at Reprocentralen (not through mail). If you copy the exam papers yourself, provide the number of copies in the field above.

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School of Health sciences

WRITTEN EXAMINATION

Course: Pathophysiology and pharmacology

Examination: Written exam 1

Course code: BM544G

Credits for written examination: 4.5

Date: 2025-06-09

Examination time: 14:15-18:30

Examination responsible: Anna Benrick

Teachers concerned: Cathal O'Hare and Katarina Skogfält

Aid at the exam/appendices: No aids allowed

Other

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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Name:_____

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Pathophysiology

1. Describe the pathophysiological process behind an ischemic stroke, from the underlying cause to cellular damage in the brain tissue. (4p)

2. How do lipid metabolism abnormalities in hyperlipidemia contribute to endothelial injury and the development of unstable plaques? What role do immune cells play in this process? (4p)

3. In asthma, airway remodeling occurs over time. Describe the pathophysiological changes in the airway walls and how these affect breathing. (4p)

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4. COPD includes both chronic bronchitis and emphysema. Explain the pathophysiological difference between these two subtypes and how they affect oxygen uptake and carbon dioxide elimination. (3p)

5. Describe in detail what happens at the cellular level in the myocardium during a transmural myocardial infarction. How does this affect cardiac function? (3p)

Multiple Choice Questions (0.5p each)

6. Which of the following symptom patterns is most characteristic of an acute ischemic stroke? (0.5p)

a) Gradual onset of walking difficulties and tremors
b) Sudden weakness on one side of the body and difficulty speaking
c) Shortness of breath during exertion and chest pressure
d) Confusion and difficulty swallowing after meals

7. Which of the following best explains why a CT scan is the first imaging choice in suspected acute stroke? (0.5p)

a) It can measure cerebral blood flow in real-time.
b) It reliably detects ischemic areas within the first 5 minutes.
c) It is fast, widely available, and can rule out hemorrhage.
d) It provides detailed images of brain metabolism

8. Which blood biomarker is most specific for diagnosing an acute myocardial infarction? (0.5p)

a) BNP
b) Myoglobin
c) Troponin T
d) CRP

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9. Which of the following statements best describes asthma? (0.5p)

a) It is primarily caused by bacterial infections
b) It is characterized by reversible bronchoconstriction
c) It is an acute, non-inflammatory condition
d) It frequently leads to permanent fibrosis of the alveolar wall

True/False (0.5p each)

10. Chronic hypertension can contribute to impaired kidney function and proteinuria. (0.5p)

11. Spirometry is a diagnostic tool that can be used to confirm COPD. (0.5p)

12. COPD is fully reversible with bronchodilator therapy. (0.5p)

13. Elevated HDL cholesterol levels increase the risk of developing atherosclerosis. (0.5p)

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Pharmacology

14. Explain how genetic polymorphism of CYP2C19 can affect the clinical response of patients taking the P2Y12 antagonist clopidogrel. 2p

15. Describe the mechanism of action by which aspirin inhibits platelet aggregation. 3p

16. Name a group of drugs that act by binding to antithrombin III. 1p

17. Warfarin is highly bound to plasma albumin. How can this lead to potential drug interactions? 2p

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18. Describe the mechanism of action of ACE inhibitors. 3p

19. Why do anticholinergics have little or no action at skeletal neuromuscular junctions (NMJs) or autonomic ganglia? 1p

20. Which of the following is not a common anticholinergic side effect? Put a cross in the box beside the correct answer. 1p

Blurred vision	
Confusion	
Urinary frequency	
Mydriasis	
Constipation	
Dry mouth	

21. How do dihydropyridine and non-dihydropyridine calcium channel blockers differ in terms of their affinity for vascular and cardiac calcium channels? 2p

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22. Why should certain drugs such as warfarin be taken at least 1 to 2 hours before, or 4 to 6 hours after, bile acid sequestrants? 2p

23. Describe the mechanism of action by which betablockers reduce blood pressure. 3p

24. Why may abrupt withdrawal of betablockers induce rebound hypertension? 2p

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

	True	False
Use of β2-adrenergic agonist inhalers can cause oropharyngeal candidiasis.		
β2 Adrenoceptors (β2 ARs) located on airway smooth muscles are G protein–coupled receptors subtype Gq.		
Short acting β2-adrenergic agonists are used as needed for quick relief of symptoms during an asthma flare or exacerbation.		
Adverse effects of β2-adrenergic agonists include tachycardia and skeletal muscle tremors.		