

Name: _____

Personal ID number: _____

School of Health sciences

WRITTEN EXAMINATION

Course: Pathophysiology and pharmacology

Examination: Written exam 1

Course code: BM544G

Credits for written examination: 4.5

Date: 2024-11-15

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

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 $E \geq 60\%$, $D \geq 68\%$, $C \geq 76\%$, $B \geq 84\%$, $A \geq 92\%$

Examination results should be made public within 18 working days

Good luck!

Total number of pages



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1. Explain the pathophysiological mechanism by which hyperlipidemia contributes to atherosclerosis. What role does inflammation play in this process? (4p)
2. Explain the pathophysiological mechanism of myocardial infarction (MI), starting from the initial cause to the consequences at the cellular level. (4p)



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3. In asthma, which factors contribute to the **chronic airway hyperresponsiveness** seen in patients, and how does this impact the progression of the disease? (4p)
4. Hormonal imbalances can contribute to hypertension in women. For women using contraceptive pills containing high levels of estrogen, the risk of developing hypertension is increased. What is the underlying mechanism for this increased risk? (3p)

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5. Describe the difference in mucus production between emphysema and chronic bronchitis, and explain the reason for this difference. How does emphysema affect gas exchange? (3p)

6. Clinically, angina is classified according to the intensity and the duration of symptoms. Write the correct angina classification beside the right description in the box below. (1p)

Description	Angina classification
The pain occurs only with exertion	
The pain occurs at rest	

7. Which symptom pattern is most indicative of an ischemic stroke? (0.5p)

Options:

- a) Gradual onset of memory loss and disorientation over weeks
- b) Sudden, one-sided facial droop and difficulty speaking or understanding speech
- c) Shortness of breath with chest tightness
- d) Persistent fatigue and mild cognitive decline over months



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8. Which statement best describes why hypertension is often referred to as the "silent killer"? (0.5p)

Options:

- a) It often causes sudden, severe symptoms such as headaches and vision changes.
- b) It leads to gradual vascular damage without noticeable symptoms, increasing the risk of cardiovascular diseases.
- c) It presents obvious symptoms early, which may lead to delayed treatment.
- d) It affects only elderly individuals, who may not notice symptoms.

9. Which lipid profile component is most directly linked to atherosclerosis and cardiovascular risk? (0.5p)

Options:

- a) Elevated HDL cholesterol levels
- b) Low LDL cholesterol levels
- c) Elevated LDL cholesterol and triglycerides
- d) Low total cholesterol

10. Which of the following biomarkers is most useful in diagnosing a myocardial infarction? (0.5p)

Options:

- a) C-reactive protein (CRP)
- b) Troponin I/T
- c) D-dimer
- d) Hemoglobin A1c

11. Which diagnostic method is most commonly used to confirm an ischemic stroke? (0.5p)

Options:

- a) Electrocardiogram (ECG)
- b) Computed Tomography (CT) Scan
- c) Spirometry
- d) Fasting blood glucose

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12. True or False: Chronic hypertension can cause damage to the blood vessel walls, leading to an increased risk of atherosclerosis and organ damage over time. (0.25)
13. True or False: Chronic Obstructive Pulmonary Disease (COPD) is characterized by persistent airflow limitation resulting from an inflammatory response involving neutrophils, macrophages, and CD8+ T-cells, primarily due to long-term exposure to environmental irritants like cigarette smoke. (0.25p)



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

15. State one therapeutic use for aspirin. 1p

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



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17.

- a) Increased levels of which peptide is thought to cause a dry cough in patients taking ACE inhibitors? 1p

- b) Explain how increased levels of this peptide can reduce blood pressure. 2p

18. Describe the mechanism of action of HMG-CoA reductase inhibitors (statins).
3p

19. Why should liver function be evaluated prior to starting therapy with HMG CoA reductase inhibitors? 1p



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20. Why is the simultaneous use of drugs such as macrolide antibiotics (clarithromycin, erythromycin), with HMG CoA reductase inhibitors a risk factor for rhabdomyolysis? 2p
21. Which type of calcium channel blockers are particularly beneficial in the treatment of hypertension? 1p
22. How can bile acid sequestrants interact with negatively charged drugs such as warfarin (coumarins)? 1p
23. Why is it important for patients taking warfarin (coumarins) to maintain an international normalised ratio (INR) within the optimal range? 1p
24. Why should short acting beta-2-agonists not be used as monotherapy for patients with persistent asthma? 1p

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25. Why do inhaled anticholinergics not enter the systemic circulation or the CNS, restricting effects to the pulmonary system? 1p

26. Which group of drugs inhibit phospholipase A2? 1p

27. Name a group of drugs that act by binding to antithrombin III, with the subsequent rapid inactivation of coagulation factors. 1p

28. Which of the following IS a common side effect of beta-2-agonists? Put a cross in the box beside the correct answer. 0,5p

Skeletal muscle tremors	
Dry mouth	
Bradycardia	
Oropharyngeal candidiasis	
Decreased growth in children	



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29. Which of the following IS a common side effect of anticholinergics? Put a cross in the box beside the correct answer. 0,5p

Myalgia	
Osteoporosis	
Diarrhea	
Blurred vision	
Urinary incontinence	