

**UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES****DEPARTMENT OF PHARMACY****SECOND BPHARM PART I EXAMINATION – MAY/JUNE 2026****PH 2134 PATHOLOGY AND PHARMACOLOGY I – SEQ****TIME: THREE HOURS****INSTRUCTIONS**

- There are six questions in parts A, B, C, D, E and F of this SEQ paper.
- Answer all questions.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

PART A**1.**

- 1.1. Define the term bioavailability. (10 marks)
- 1.2. Explain how first-pass metabolism affects the bioavailability of an orally administered drug. (20 marks)
- 1.3. State two strategies to overcome extensive first-pass metabolism in drugs. (10 marks)
- 1.4. Differentiate between Phase I and Phase II reactions of drug metabolism, giving two examples for each phase. (25 marks)
- 1.5. List three renal processes involved in drug elimination. (10 marks)
- 1.6. Explain how urine alkalization can be used in the management of phenobarbital overdose, with reference to the concept of ion trapping. (25 marks)

2.

- 2.1. Name two main anatomical divisions of the nervous system. (10 marks)
- 2.2. Compare the sympathetic and parasympathetic divisions in terms of: (i) origin of preganglionic fibers, (ii) length of pre- and postganglionic fibers, (iii) location of ganglia, and (iv) type of response. (20 marks)
- 2.3. Briefly describe the actions of acetylcholine in following organs/systems:
 - 2.3.1. Cardiovascular system (10 marks)
 - 2.3.2. Gastrointestinal system (10 marks)
 - 2.3.3. Eye (10 marks)
- 2.4. Physostigmine is primarily used as an antidote for the management of atropine toxicity.
 - 2.4.1. Briefly describe the mechanism of action of physostigmine in the management of atropine toxicity. (20 marks)
 - 2.4.2. List two other therapeutic uses of physostigmine. (10 marks)
 - 2.4.3. List three adverse drug reactions of physostigmine. (10 marks)

3.

- 3.1. List two nondepolarizing neuromuscular blocking agents. (05 marks)
- 3.2. Briefly explain the mechanism of action of nondepolarizing neuromuscular blockers at low doses and high doses. (20 marks)

PART B

- 3.3. Pregnant women are a special patient population, and healthcare professionals should remain vigilant when treating them.
- 3.3.1. State two major considerations when using drugs during pregnancy. (10 marks)
- 3.3.2. Briefly explain why drug dosage requirements may increase during pregnancy. (15 marks)

PART C

- 3.4. Atorvastatin is used in the treatment of hyperlipidaemia.
- 3.4.1. Name the pharmacological class of atorvastatin. (05 marks)
- 3.4.2. List four other classes of antihyperlipidaemic drugs and give one example drug for each class. (20 marks)
- 3.4.3. Briefly describe the mechanism of action of atorvastatin. (25 marks)
4. A 60-year-old female is treated with a combination of furosemide and spironolactone for heart failure and ankle oedema.
- 4.1. Name the pharmacological drug classes of furosemide and spironolactone. (10 marks)
- 4.2. Describe the pharmacological basis for the use of furosemide in this patient. (25 marks)
- 4.3. Briefly explain the mechanism of action of spironolactone. (25 marks)
- 4.4. Mention two other indications for each of the drugs: furosemide and spironolactone. (20 marks)
- 4.5. Hydrochlorothiazide can be used instead of furosemide for the above patient. Describe the effects of hydrochlorothiazides on the patient's electrolyte balance. (20 marks)

PART D

5.

- 5.1. Name five purposes of inflammation. (20 marks)
- 5.2. List five nuclear changes observed in tumor cells. (20 marks)
- 5.3. Briefly describe the outcomes of acute inflammation. (30 marks)
- 5.4. Define the following terms:
- 5.4.1. Immunodeficiency (15 marks)
- 5.4.2. Immunosuppression (15 marks)

6.

6.1. List five factors important in inducing immunological tolerance in an individual.

(25 marks)

PART E

6.2. State four features that distinguish adaptive immunity from innate immunity. (05 marks)

6.3. Briefly describe the key steps involved in B-cell activation. (20 marks)

PART F

6.4. Briefly describe the mechanism underlying type III hypersensitivity reactions. (20 marks)

6.5. List two factors affecting the intensity of type III hypersensitivity reactions. (10 marks)

6.6. Briefly describe cytokine-mediated inflammation. (20 marks)

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