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UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHARMACY

FOURTH BPHARM PART I EXAMINATION – MARCH/APRIL 2026

PH 4134 PHARMACEUTICAL TECHNOLOGY– SEQ

TIME: THREE HOURS

INSTRUCTIONS

- There are **six** questions in parts **A and B** 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. List five key particle properties that should be considered when selecting a powder for pharmaceutical manufacturing. (***25 marks***)

1.2. Name the commonly used particle size-reduction mechanisms in pharmaceutical production, and explain how their underline principles differ. (***25 marks***)

1.3. A powder exhibits an angle of repose of 40° and a compressibility index of 30%. Interpret these results in terms of powder flow and compressibility, and provide recommendations for the production team to optimize handling and processing. (***50 marks***)

2.

2.1. List five pharmaceutical unit operations that can be performed using a Fluidized Bed Processor (FBP). (***25 marks***)

2.2. Briefly describe the three main types of Fluidized Bed Processors used in the pharmaceutical industry. (***25 marks***)

2.3. Using a neat schematic diagram, explain the construction and operating principle of a Fluidized Bed Processor. (***50 marks***)

3.

3.1. List the key Industry 4.0 technologies that can be applied in pharmaceutical manufacturing. (***25 marks***)

3.2. Briefly describe the major benefits that the pharmaceutical industry can gain through the implementation of Industry 4.0 technologies. (***25 marks***)

3.3. Explain the key challenges associated with implementing Industry 4.0 technologies in the pharmaceutical industry. (***50 marks***)

PART B

4.

4.1. Define the term "Bioburden." (***20 marks***)

4.2. List six physical sterilization methods. (***30 marks***)

4.3. Discuss the usage and suitability of preservatives in sterile injections, including their role in maintaining product safety and stability. (***50 marks***)

5.

5.1. List the properties of an ideal semi-solid preparation. (***14 marks***)

5.2. Briefly explain following different types of ointments. (***36 marks***)

5.2.1. Epidermic ointment

5.2.2. Endodermic ointments

5.2.3. Diadermic ointments

5.3. Discuss the role of emulsifiers in stabilizing emulsions, with emphasis on how the Hydrophilic – Lipophilic Balance (HLB) value influences their selection and effectiveness. (***50 marks***)

6.

6.1. Briefly discuss the application of drying in pharmaceutical manufacturing, including its impact on product stability and quality. (***30 marks***)

6.2. List five factors affecting the rate of drying in pharmaceutical processes. (***20 marks***)

6.3. Explain the working principles of reverse osmosis and its applications in the pharmaceutical industry. (***50 marks***)

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