THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF PHARMACY
THE ACADEMIC YEAR 2024/2025 – SEMESTER I

BACHELOR OF PHARMACY HONOURS
FMU3302 PHYSICAL PHARMACY LEVEL 3
FINAL EXAMINATION
DURATION: THREE (03) HOURS

DATE: 22ND APRIL 2025 TIME: 9.30 A.M. – 12.30 P.M.

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Part B- Short Answer Questions (20 Marks)

Answer all the questions.

1.

1.1 List two (02) major polymerization processes. (02 marks)

I.....

II.....

1.2 List two (02) differences between the processes you mentioned in 1.1. (02 marks)

I.....

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II.....

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1.3 List three (03) types of emulsifying agents and mention their emulsification mechanism.

(06 marks)

I.....

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II.....

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III.....

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2.

2.1 The degradation rate of a drug gradually decreases over time. Write the integrated rate equation for the degradation of this drug. (02 marks)

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2.2 Define the following terms. (04 marks)

2.2.1 Dissolution

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2.2.2 Solubility

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2.3 List four (04) factors affecting dissolution. (04 marks)

I.....

II.....

III.....

IV.....

Index No .....

Part C – Structured Essay Questions (60 Marks)

Answer all the questions.

1.

1.1 State three (03) types of thermodynamic systems. (03 marks)

1.2 State the first law of thermodynamics. (02 marks)

1.3 A drug solubilizes at 25 °C in water at a constant pressure. The enthalpy change for this reaction is –20 kJ whereas as entropy change is 40 J/K.

1.3.1 Calculate the Gibbs' free energy for the above reaction. (08 marks)

1.3.2 Comment whether the above reaction is spontaneous or not, by giving reasons. (02 marks)

2.

2.1 List three (03) differences between flocculated and deflocculated suspensions. (03 marks)

2.2 State two (02) mechanisms of stabilization of colloids. (04 marks)

2.3 Briefly explain how you can achieve a 'controlled flocculation' in a pharmaceutical suspension using DLVO theory. (08 marks)

3.

3.1 Define the term 'zeta potential'. (03 marks)

3.2 List two (02) mechanisms by which colloidal particles achieve their surface charge. (04 marks)

3.3 Explain how zeta potential can be changed to achieve an effective colloidal removal. (08 marks)

4. Fluorine-18 (^{18}F) is decay to oxygen-18 (^{18}F). The atomic numbers of F and O are 9 and 8 respectively.

4.1 Name a possible decay mechanism for the above reaction. (02 marks)

4.2 What are the characteristics of the radiation generated from the mechanism you mentioned in 4.1? (03 marks)

4.3 Briefly explain how you predict the decay mechanism mentioned in 4.1. (10 marks)