NATIONAL UNIVERSITY OF LESOTHO

FACULTY OF HEALTH SCIENCES

DEPARTMENT OF PHARMACY

BACHELOR OF PHARMACY (HONOURS)

PHA4302- DRUG FORMULATIONS AND DELIVERY

FINAL EXAMINATION

JANUARY 2024 TIME: 3 HOURS TOTAL: 100 MARKS

INSTRUCTIONS

- **ANSWER ALL QUESTIONS.**
- **BEGIN EACH QUESTION ON A NEW PAGE**

1. Discuss how you would prepare the dissolution media for the *in vitro* assessment of drug dissolution at fed state and fully explain the rationale of including each of the components of your media. **(20 marks)**
2. Outline the procedure for measuring the *ex vivo* absorption of drugs using an everted gut sac method. **(10 marks)**
3. Discuss how you would assess the ability of the drug to permeate the gastrointestinal membrane *in vitro* using a physicochemical method. **(10 marks)**
4. Discuss how drug is systemically delivered following administration by the following routes: **(10 marks)**

   -Poorly water-soluble drugs by IM injection (2)

   -Poorly water-soluble drugs by subcutaneous injection (2).

   -Lipophilic drug powder by pulmonary or inhaled route (2).

   -Lipophilic drug by transdermal (2).

   -Lipophobic drug IV injection (2)

5. Discuss different mechanism of drug deposition in the airways. **(10 marks)**
6. Outline how you would formulate an IV injection solution using water for injection (sterile) and a drug containing high levels of bioburden. **(10 marks)**
7. Discuss how you would carry out the separation or purification of a mixture of charged biopharmaceutical proteins using a suitable separation technique. **(10 marks)**

8. Discuss how you would combine the use of column chromatography and the UV/Vis spectroscopy to recover an active pharmaceutical ingredient directly from a fresh leafy medicinal plant. **(20 marks)**