NATIONAL UNIVERSITY OF LESOTHO

FACULTY OF HEALTH SCIENCES

DEPARTMENT OF PHARMACY

BACHELOR OF PHARMACY (HONOURS)

PHA5304- NOVEL DRUG DELIVERY SYSTEMS

FINAL EXAMINATION

JANUARY 2024 TIME: 3 HOURS TOTAL: 100 MARKS

INSTRUCTIONS

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

1. Explain why designing and formulating dosage forms as modified release is considered beneficial in drug delivery. **(5 marks)**
2. Describe the ‘’Repeat Action’’ modified release dosage forms (3) and design a suitable RA dosage form (7). **(10 marks)**
3. Describe the structural design of ion exchange resin dosage form (4) and discuss the mechanism of its drug release (6). **(10 marks)**
4. Discuss how the Barrier Coating dosage form achieves its loading and maintenance doses (4) and explain in more details how drug is release from this dosage form (6). **(10 marks)**
5. a) Paclitaxel is a poor aqueous solubility anticancer drug. Discuss how you would go about in designing (6) and formulating (6) paclitaxel-loaded lipid nanoparticles which can effectively deliver this drug to brain tumours. (This novel dosage form should qualify to provide both high drug loading efficiency and Enhanced Permeability and Retention (EPR) effect.) **(12 marks)**

   b) Explain drug release mechanisms of the novel dosage form above. **(8 marks)**
6. Discuss how you would design a novel natural polymeric nanoparticle with enhanced drug targeting (8) and improved residence time at the site of action (7). **(15 marks)**
7. Describe the monoclonal antibodies (2) and illustrate the preparation process of this type of antibodies (8). **(10 marks)**
8. Outline how you would prepare the ‘normal’ immunoglobulins. **(10 marks)**
9. Discuss how you would perform the procurement of radio nuclides/isotopes (3) and formulate (7) a radiopharmaceutical intended for bone imaging. **(10 marks)**