



# KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2019/2020

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF  
PHARMACY (BPharm Level III)

PPA 320: PHARMACEUTICS II

DATE: MONDAY 29<sup>TH</sup> MARCH 2021

TIME: 2.00 P.M. – 5.00 P.M.

---

**INSTRUCTIONS:**

- i. Answer ALL Questions
- ii. Answer each section in a separate booklet.

**SECTION A: ANSWER ALL QUESTIONS**

1. Explain the difference between a perfect mix and a random mix. (2 marks)
2. Describe the following types of mixtures;
  - a) Positive mixtures (2 marks)
  - b) Neutral mixtures (2 marks)
  - c) Negative mixtures (2 marks)
3. Explain the process of convective static drying of wet solids. (2 marks)
4. Outline the properties of a product that has undergone freeze drying. (2 marks)
5. Compare and contrast solid-solid and liquid-liquid mixing mechanisms. (4 marks)
6. Discuss the reasons for monitoring a mixing process. (4 marks)
7. Describe the lacey mixing index. (2 marks)
8. Describe equipment for mixing of semi-solids? (2 marks)
9. Explain how vortex formation is minimized in a propeller mixer? (2 marks)
10. Describe four types of powder segregation. (4 marks)
11. Explain the applications of solid/liquid filtration in pharmaceutical processing. (2 marks)
12. Outline the following:
  - a) Conditions required for use of membrane filters. (2 marks)
  - b) The mechanisms of filtration. (2 marks)

---

INVOLVEMENT IN ANY EXAMINATION IRREGULARITY SHALL LEAD TO DISCONTINUATION

13. Discuss the advantages of fluidized bed drying? (2 marks)
14. A substance weighs 20kg dry weight and has an initial moisture content  $M$  of 0.9kg/kg and a critical moisture content  $M_c$  of 0.08kg/kg. If the constant drying rate is  $0.410 \times 10^{-3}$  kg/s/m<sup>2</sup>, how long will the constant drying rate period last if the drying tray area is 2m<sup>2</sup>. (2 marks)

### **SECTION B: ANSWER ALL QUESTIONS**

1. Explain the characteristics of turbulent flow. (2 marks)
2. Describe the equation that represents plastic flow. (2 marks)
3. Differentiate between the following terms:
  - a) Dynamic and kinematic viscosity. (2 marks)
  - b) Newtonian and non-Newtonian fluids. (2 marks)
4. a) An Ostwald viscometer was used to measure acetone, which was found to have a viscosity of 0.313cp at 25°C. Its density at 25°C is 0.788 g/cm<sup>3</sup>. What is the kinematic viscosity of acetone at 25°C? (3 marks)
- b) Water is ordinarily used as a standard for viscosity of liquids. Its viscosity at 25°C is 0.8904 cp. What is the viscosity of acetone relative to that of water (relative viscosity,  $\eta_r$ ) at 25°C? (3 marks)
5. A plastic material was found to have a yield value of 5200 dynes/cm<sup>2</sup>. At shearing stresses above the yield value, sigma ( $\sigma$ ) was found to increase linearly with gamma ( $\gamma$ ). If the rate of shear was 150 sec<sup>-1</sup> when sigma ( $\sigma$ ) was 8000 dynes/cm<sup>2</sup>, calculate  $\eta_p$ , the plastic viscosity of the sample. (4 marks)
6. Plot the rheogram that show the following
  - a) Plastic flow (2 marks)
  - b) Pseudoplastic flow (2 marks)
  - c) Dilatant flow (2 marks)
7. Using stokes equation, derive an expression of the coefficient of dynamic viscosity. (6 marks)
8. Discuss thixotropy in rheology. (4 marks)
9. Describe the following types of viscometers.
  - a) Capillary viscometer. (3 marks)
  - b) Falling Sphere viscometer. (3 marks)

### SECTION C: ANSWER ALL QUESTIONS

1.     (a)     Differentiate between the Capillary rise method and the Du nouy method of measuring surface tension. (6 marks)
- (b)     Classify surface active agents (surfactants) on the basis of their polar head groups. (4 marks)
- (c)     Explain how Hydrophilic-Lipophilic (HLB) numbers assigned are to surfactants? (2 marks)
2.     Discuss the classification of colloids based on the following properties.
  - (a)     Physical state of dispersed phase and dispersion medium. (4 marks)
  - (b)     Nature of interaction between dispersed phase and dispersion medium. (4 marks)
  - (c)     Types of particles of the dispersed phase. (2 marks)
3.     Describe the Shultz-Hardy rule in relation to stability of lyophobic colloids. (4 marks)
4.     (a)     Draw and label one and two component phase diagrams. (3 marks)
- (b)     Explain Gibb's Phase rule as it applies to phase diagrams. (3 marks)
5.     Discuss the significance of complexes in drug formulation. (8 marks)