



W1-2-60-1-6

JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

UNIVERSITY EXAMINATION 2015/2016

BACHELOR OF PHARMACY

THIRD YEAR, THIRD SEMESTER MAIN EXAMINATION

PHA 2308: PHARMACEUTICS III

DATE: AUGUST 2016

TIME: THREE HOURS

INSTRUCTIONS: ANSWER ALL QUESTIONS IN SECTION A (60 MARKS) AND ANY OTHER TWO QUESTIONS FROM SECTION B (40 MARKS).

ILLUSTRATE YOUR ANSWERS WITH DIAGRAMS/ STRUCTURES WHERE APPROPRIATE

SECTION A

1. a. Define nanotechnology (2marks) 1
b. What are the advantages for using nanoparticles in drug delivery (3marks) 2
2. a. Describe sublingual and buccal drug delivery (2marks) 2
b. Outline the advantages of sublingual delivery over buccal delivery (3marks) 3
3. Describe the tumor enhanced permeability and retention effect (EPR) and explain how this is taken advantage of in drug targeting (5marks) 1
4. a. What is bioavailability (2marks) 2
b. 100mg of a drug molecules are ingested as a tablet. Only 90mg of those molecules survive the GI tract. Then 81mg make it past the gut wall and into the portal vein. Of the mg that enter the liver, only 41mg make it to the systemic circulation. Calculate the bioavailability (3marks) 3

49:

$$\text{Relative bioavail} = \frac{AUC_A}{AUC_B}$$

$$B-A = AWC$$

5. a. Describe enterohepatic recycling (2marks) 2
- b. What effect does this have on drug distribution (3marks) 1
6. List and explain artificial methods used in drug elimination (5marks) 3
7. Describe bioactivation (5marks) 2
8. What is the role of drug distribution processes in the body (5marks) 2
9. Describe factors to be considered in the design of a drug delivery system (5marks) 3
10. State and explain the mechanisms of particle deposition in the airways (5marks) 3
11. a. Describe the gel forming solution as a dosage form in the eye (4marks) 3
- b. What is its advantage over the solution as a dosage form (1 mark) 1
12. a. Describe one design of a transdermal patch used in transdermal drug delivery (2marks) 2
- b. Explain how the drug moves from the patch into the blood stream (3marks)

SECTION B

Sci 1-3
 Biochem with → 1 km
 Biological comparison → 5 km

13. Discuss drug metabolism under the following headings
- a. Phases of drug metabolism (6marks)
- b. Factors influencing drug metabolism (9marks)
- c. Consequences of drug metabolism (5marks)
14. Discuss nasal drug delivery under the following headings
- a. Physicochemical factors affecting drug absorption in the nose (5marks) 4

Age Biological
 pH of urine
 Binding of proteins
 Physicochem. x rcs
 Disease states
 Polymorphism

b. Strategies that have been used to improve drug bioavailability through the nose (9marks) 4

c. Delivery systems used in nasal drug delivery (6marks) 3

15. Discuss factors that determine drug distribution in the body (20marks) 15

Dose states ~~low~~ ...
Physicochem properties ✓
plasma protein binding ✓
specialized barriers ✓
Blood perfusion ✓