120

(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS

FOR THE DEGREE
OF
BACHELOR OF MEDICINE AND SURGERY

COURSE CODE: MBS 308

COURSE TITLE: BASIC PHARMACOLOGY

END OF TERM 1 EXAMINATION

Instructions

Time 3 hours

Answer all questions

Section A comprises of 20 MCQs, each carrying 1 mark

Section B comprises 8 short answer questions carrying a total of 40 marks

Section C comprises of 2 long essay questions each carrying 20 marks

SECTION A: Multiple Choice Questions (MCQs)

1. Which one of the following is true for drugs that are highly bound to albumin?
   a. Effectively cross the blood brain barrier (BBB)
   b. Have a large volume of distribution (Vd)
   c. Often contain quaternary nitrogens
   d. Can undergo competition with other drugs for albumin- binding sites

2. Which one of the following is most likely to be impaired by liver diseases?
   a. Drug metabolism
   b. Drug absorption
   c. Drug protein binding
   d. Drug excretion

3. Biotransformation is the process where drugs:

   a. Are converted to more polar, water soluble molecules through enzymatic reaction (s)
   b. Are bound to plasma proteins
   c. Are absorbed intravenously
   d. Are excreted in the liver

4. Drug biotransformation takes place in the:
   a. Liver
   b. Heart
   c. Kidneys
   d. lungs

5. Most drugs gain entry to cells by:

   a. Passive diffusion with zero-order kinetics
   b. Passive diffusion with first-order kinetics
   c. Active transport with zero-order kinetics
   d. Active transport with first-order kinetics

6. All of the following factors might affect the rate and/or extent of drug absorption of orally administered drugs **EXCEPT:**

   a. gastric emptying time
   b. intestinal motility
   c. the formulation of the drug
   d. a generic form of the drug

7. Peter, a newly admitted patient, has a history of liver disease. In planning his pharmacotherapy, the clinicians must consider that the liver disease may:
    a. increase the excretion rate of a drug
    b. impair the ability to metabolize the drug and consequent toxicity
    c. Result in the necessity to increase the dosage of a drug
    d. decrease the rate of drug absorption

8. Which of the following statements is **TRUE** concerning the renal excretion of drugs?

    a. Drugs that are ionized in the renal tubule are more likely to undergo passive reabsorption than those that are unionized
    b. Low-molecular-weight drugs are much more likely to be actively secreted than filtered
    c. Only the fraction of the drug that is not bound to plasma proteins is filtered by the glomerulus.
    d. Decreasing renal tubular fluid pH will increase rate of elimination of weakly acidic drugs

9. If a patient takes a drug on an empty stomach, the drug will be:
    a. absorbed more slowly
    b. neutralized by pancreatic enzymes
    c. affected by enzymes in the colon
    d. absorbed more rapidly

10. Which one of the following is a phase I drug metabolism reaction?
    a. acetylation
    b. glucuronidation
    c. methylation
    d. reduction

11. Which one of the following drugs is **NOT** susceptible to the first- pass effect?
    a. Dextorpropoxyphene
    b. Metoprolol
    c. Chormethiazole
    d. Warfarin

12. What is the pharmacological classification of Isosorbide dinitrate?
    a. It is a narcotic analgesic
    b. It is an antidepressant
    c. It is a vasodilator drug
    d. It is a diuretic

13. In which one of the following clinical conditions is Ergotamine useful?

    a. In the treatment of angina pectoris
    b. In the treatment of hypertension
    c. In the treatment of Ischemic Heart Disease (IHD)
    d. In the treatment of migraine headaches

14. Which one of the following is a macrolide antibiotic?
    a. Ciprofloxacin
    b. Streptomycin
    c. Azithromycin
    d. Gentamycin

15. Which one of the following antimalarials is associated with causation of hemolytic anemia in susceptible individuals?
    a. Lumefantrine
    b. Artemether
    c. Dihydroartemisinine
    d. Primaquine

16. Why are Proton Pump inhibitors effective in the treatment of gastric ulcer disease?
    a. Because they react with gastric acid in a neutralization reaction
    b. Because they form a protective coat along the lining of the stomach
    c. Because they inhibit the pumping of hydrogen ions (H^+) by the parietal cells in the gastric mucosa
    d. Because they are blockers at the muscarinic cholinergic receptors on the glandular epithelial cells lining the stomach wall

17. Why is glyceryl trinitrate administered to patients sublingually?
    a. Because it causes gastric irritation when introduced in the gastrointestinal tract
    b. Because it has a bad taste
    c. Because in induces nausea and vomiting when introduced directly into the gastrointestinal tract
    d. Because it is susceptible to the first- pass effect

18. Why is amikacin **NOT** administered enterally during its clinical use?
    a. Because it is degraded by gastric acid
    b. Because it triggers nausea and vomiting when introduced directly into the gastrointestinal tract
    c. Because it cannot be absorbed from the gastrointestinal tract due to presence of amino sugars in its molecular structure
    d. Because it is digested by gastric proteases in the stomach

19. Which one of the following antiretrovirals is effective in the prevention of Mother- to-Child (PMTC) transmission of HIV infection?
    a. Stavudine
    b. Dideoxycytidine (ddC)
    c. Atazanavir
    d. Nevirapine

20. Which one of the following drugs is administered intranasally by inhalation in the treatment of allergic rhinitis?
    a. Salbutamol
    b. Terbutaline
    c. Sodium Cromoglycate
    d. Salmeterol

SECTION B: SAQs: 40 marks; Answer all

1. Describe four mechanisms by which drug permeation occurs across biological membranes. **(4 marks)**

2. Explain how acidic urine pH affects the excretion of acidic and basic drugs. **(4 marks)**

3. Explain how pH affects movement of drugs or drug metabolites across biological membranes. **(4 marks)**

4. Describe two common prescription errors, with relevant examples. **(4marks)**

6. As an intern doctor you have prescribed amoxicillin 60 mg, po, three times/day for a child weighing 5.7 Kg. The drug available in the ward is amoxicillin 125/5ml for oral suspension, labeled paedriatic dosage range: 20-40mg/kg/day in three equal doses. The nurse administers 4.2 ml three times/day. Comment on the accuracy of the administered dose **(4 marks)**

7. Discuss the use of drugs in the following:
    a. Primary prevention of disease **(5 marks)**
    b. Secondary prevention of disease **(5 marks)**

8. Discuss use of the sublingual route of drug administration. **(4 marks)**
Your discussion should include:
    a. Advantages of this route of drug administration. **(3 marks)**
    b. Disadvantages of this route of drug administration. **(3 marks)**

SECTION C: LAQs: Answer (40 marks)

1. Drug Z is administered orally. Describe in detail the four key pharmacokinetic processes which the drug undergoes over the course of time and the key factors affecting each of these processes **(20 marks)**

2. **a)** Using a specific example, discuss the use of subcutaneous implants as a drug delivery system. **(10 marks)**

   b) Discuss use of the depot effect when various penicillin formulations are employed in therapy through intramuscular drug administration. **(10 marks)**