13C

(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2023/2024 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER EXAMINATIONS

FOR THE DEGREE OF
1. BACHELOR OF SCIENCE IN CLINICAL MEDICINE AND
2. BSc IN PHYSIOTHERAPY

COURSE CODE: HCM 252/BSP 213 (DIRECT ENTRY)

COURSE TITLE: GENERAL PHARMACOLOGY/ PHARMACOLOGY I

DATE: FRIDAY 8TH DECEMBER 2023 **TIME:** 8:00AM – 10:00AM

Instructions

Time 2 hours

Answer all questions

Section A comprise of 20 MCQs 1 mark each

Section B comprise 9 short answer questions: a total of 40 marks

Section C comprises of 3 long essay questions: 20 marks each

SECTION A: MULTIPLE CHOICE QUESTIONS MCQ: ANSWER ALL QUESTIONS (20MARKS)

1. 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

2. A 500-mg dose of a drug X is effective for a duration of 6 hours. For how long would a 1-g dose of the same drug remain effective if its half-life is 8 hours?

    a. 12 hours
    b. 14 hours
    c. 16 hours
    d. 24 hours

3. Drug biotransformation/metabolism takes place primarily in the:
    a. Liver
    b. Heart
    c. Kidneys
    d. lungs

4. The blood concentration of a drug decreases as follows: 100 mg -2hr → 50 mg -2hr → 25 mg- 2hr → 12.5 mg, which of the following statements is correct about the drug pharmacokinetic?

    a. The rate of elimination is constant
    b. The elimination half-life varies with the dose
    c. The volume of distribution varies with the dose
    d. The rate of elimination varies directly with the dose

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

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. the presence of food
    c. the formulation of the drug
    d. a generic form of the drug

7. Which route of drug administration is most likely to subject a drug to first pass effect?
    a. intravenous
    b. inhalational
    c. oral
    d. sublingual

8. The half-life of drug F is 40 hours and is being given to a patient once daily; steady state will be reached shortly following which DOSE?
    a. 1st dose
    b. 3rd dose
    c. 5th dose
    d. 8th dose
9. If a drug is highly bound to plasma proteins, it:
    a. has a large volume of distribution
    b. has a high renal clearance
    c. is a likely candidate for drug interactions
    d. is most likely carried by alpha-glycoprotein
10. Which of the following is classified as a general anesthetic agent?
    a. Lidocaine
    b. Propofol
    c. Bupivacaine
    d. Mepivacaine
11. Which one of the following is a phase I drug metabolism reaction?
    a. acetylation
    b. glucuronidation
    c. methylation
    d. reduction
12. Prior to an eye examination a patient was given a drug that causes mydriasis but has no effect on accommodation. What is the most likely identity of this drug?
    a. Mecamylamine
    b. Neostigmine
    c. Phenylephrine
    d. tropicamide
13. Which one of the following is caused by parasympathomimetic drugs:
    a. Bronchodilation
    b. Mydriasis
    c. Bradycardia
14. Constipation
    Which of the following is an example of pharmacodynamics drug-drug interaction?
    a. Tetracycline + ferrous sulphate
    b. Ethanol + metronidazole
    c. Rifampicin + dolutegravir
    d. Diazepam + phenobarbitone
15. Which of the following is an example of pharmacokinetic drug-drug interaction?
    a. Tetracycline + magnesium containing anatacids
    b. Ethanol + metronidazole
    c. Rifampicin + dolutegravir
    d. Diazepam + phenobarbitone
16. Which of the following drug is not classified as a disease modifying anti-rheumatoid agent?
    a. Methothrexate
    b. Hydroxyquinone

c. Prednisolone
d. Colchicine

17. Which of the following is classified as a gaseous general anaesthetic?
    a. Isoflourane
    b. Lidocaine
    c. Ketamine
    d. Propofol
18. Which of the following is classified as a non-steroidal anti-inflammatory drug (NSAID)?
    a. Prednisolone
    b. Ibuprofen
    c. Naloxone
    d. Morphine
19. Which one of the following is **NOT** an antagonist at the nicotinic acetylcholine receptors (nAchRs)?
    a. Gallamine
    b. Atracurium
    c. α- Bungarotoxin
    d. Pilocarpine
20. Which one of the following autocoids causes dry cough in the patient when they accumulate in the respiratory tract?
    a. Leukotrienes
    b. Platelet activating factor
    c. Prostaglandins
    d. Bradykinin

SECTION B: SHORT ANSWER QUESTIONS (40MARKS)

1. Define the following:
    a. Drug action **(1 mark)**
    b. Drug potency **(1 mark)**
    c. Pharmacokinetics **(1 mark)**
    d. pharmacodynamics **(1 mark)**
2. Describe **four** processes through which drugs permeate across biological membranes. **(4 marks)**
3. Explain how urine pH affects excretion of acidic and basic drugs. **(4 marks)**
4. Describe the following drug names **(6 marks)**
    a. Chemical name
    b. International non-proprietary name
    c. Brand name
5. Describe **THREE** sources of drugs **(6 marks)**
6. Kiprono has an inulin renal clearance of 120 mL/min. He has been administered with drug X, with a clearance of 18 mL/min. If the drug X is 40% plasma protein bound, how much of the filtered drug is reabsorbed in the renal tubules? (show your calculation) **(4 marks)**

7. Describe the responses elicited by the action of α1 adrenoceptor selective agonist drug in the following organs/tissues **(6 marks)**
   a) Eye
   b) Arterioles
   c) Veins
   d) Urinary bladder
8. Outline **four** factors that are considered when selecting the most suitable route of drug administration. **(2 marks)**
9. Name **four** groups of patients that are at high risk of adverse drug reactions and ways of minimizing occurrence of such adverse reaction. **(4 marks)**

SECTION C: LAQs: Answer any TWO (40 marks)

1. Using specific Examples discuss the various forms of drug-drug interactions, including how they can be avoided in pharmacotherapy **(20 marks)**

2. Discuss any FIVE general mechanisms of drug action, give an example for each mechanism **(20 marks)**

3. Describe the synthesis, receptor pharmacology and examples of clinically important drugs that modulate the action of the following autacoids
   a) Histamines **(5 marks)**
   b) Prostaglandins **(5 marks)**
   c) Leukotrienes **(5 marks)**
   d) Serotonin **(5 marks)**