



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MEDICAL SCIENCES

**UNIVERSITY EXAMINATION FOR:**

BACHELOR OF MEDICAL LABORATORY SCIENCES

APM 4201: PHARMACOLOGY & PHARMACOGNOSY

SPECIAL/ SUPPLIMENTARY EXAMINATIONS

**SERIES: SEPTEMBER 2018**

**TIME: 2 HOURS**

**DATE:** Sep2018

## **Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of TWO SECTIONS, A AND B. Attempt ALL questions

**Circle the correct answer in section A.**

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## **Section A**

1. Which of the following is the main method for the preparation of fixed oils used in medicine?

- A) Heating the drug with organic solvents
- B) Extraction with water
- C) Cold extrusion
- D) Warm extrusion
- E) Distillation

2. Common alkaloids include all the following EXCEPT

- a) caffeine
- b) nicotine
- c) cocaine
- d) morphine
- e) eucalyptus oil

3. Which of the following pairs is correct?

- a) Foxglove - digitalis
- b) Willow bark tea - quinine
- c) Cinchona - aspirin
- d) Snakeroot –olive oil
- e) Aloe - lanolin

4. Which of the following is not an effect of aspirin?

- a) anti-inflammatory
- b) antipyretic (fever reducing)
- c) analgesic (pain relieving)
- d) anti itching
- e) blood thinning

5. Pharmacognosy is related to all of the following EXCEPT

- a) Botany
- b) Ethnobotany
- c) Astrology
- d) Marine biology
- e) Microbiology

6. Which one below is matched correctly?

- a) Angiospermae (Angiosperms) → Plants which produce flowers
- b) Gymnospermae (Gymnosperms) → Plants with two seed leaves
- c) Dicotyledonae (Dicotyledons, Dicots) → Plants which don't produce flowers
- d) Monocotyledonae (Monocotyledons, Monocots) → Plants with one seed leaf
- e) Indigenous → From another country

7. Which of the following is the skeleton of Cinchona alkaloids?

- A) Cevan
- B) Tropane
- C) Isoquinoline
- D) Rubanol
- E) Dammarane

8. What is meant by a binding site?

- a) The area of a macromolecular target that is occupied by a drug when it binds.
- b) The portion of the drug to which a drug target binds.
- c) The functional groups used by a drug in binding to a drug target.
- d) The bonds involved in binding a drug to its target.
- e) The three bonds in a cell

9. Which of the following statements is not true about receptors?

- a) Most receptors are proteins situated in the cell membrane.
- b) Receptors contain a hollow or cleft on their surface which is known as a binding site.
- c) Receptors bind chemical messengers such as neurotransmitters or hormones.

- d) Receptors catalyse reactions on chemical messengers.
- e) Receptors allow drug molecules to bind and elicit a biologic effect

10. Which of the following is not a neurotransmitter?

- a) acetylcholine
- b) cyclic AMP
- c) noradrenaline
- d) dopamine
- e) serotonin

11. Which of the following characteristics is detrimental to oral activity?

- a) stability to digestive enzymes
- b) susceptibility to metabolic enzymes
- c) stability to stomach acids
- d) solubility in both aqueous and fatty environments
- e) Stability in acid pH in the stomach

12. Which of the following would be a toxin (poison of biological origin)?

- a) Pb
- b) As
- c) Hg
- d) Atropine
- e) Cu

13. Drugs fit receptors using the lock and key model. Covalent bonds are the \_\_\_\_ and the \_\_\_\_ specific.

- a) Strongest; Most
- b) Strongest; Least
- c) Weakest; Most
- d) Weakest; Least
- e) Weakest; Weakest

14. What determines the degree of movement of a drug between body compartments?

- a) Partition constant
- b) Degree of ionization
- c) pH
- d) Size
- e) lipohilicity
- e) All of the above

15. Which of the following metabolically active tissues is the principle organ for drug metabolism?

- a) Skin
- b) Kidneys
- c) Lungs
- d) Liver
- e) GI Tract

16. Intrinsic activity is a drug's ability to elicit:

- a) Strong receptor binding
- b) Weak receptor binding
- c) Response

- d) Excretion
- e) Distribution

17. Which drug is not under the class of an organized drug?

- a) Leaves
- b) flowers
- c) Fruits
- d) Gums
- e) Branches

18. Alkaloids are \_\_\_\_\_ type of substances.

- a) Acid
- b) Neutral
- c) Chemical
- d) Basic nitrogenous
- e) Bland

19. What does “pharmacokinetics” include?

- a) Localization of drug action
- b) Mechanisms of drug action
- c) Excretion of substances
- d) Interaction of substances
- e) Manipulation of tissues

20. What is the main mechanism of most drugs absorption in GI tract is:

- a) Active transport (carrier-mediated diffusion)
- b) Filtration (aqueous diffusion)

- c) Endocytosis and exocytosis
- d) Passive diffusion (lipid diffusion)
- e) Maceration

21. What kind of substances can't permeate membranes by passive diffusion?

- a) Lipid-soluble
- b) Non-ionized substances
- c) Hydrophobic substances
- d) Hydrophilic substances
- e) Small molecules

22. Biotransformation of the drugs is mainly to render them:

- a) Less ionized
- b) More pharmacologically active
- c) More lipid soluble
- d) Less lipid soluble
- e) Palatable

23. Half life ( $t_{1/2}$ ) is the time required to:

- a) Change the amount of a drug in plasma by half
- b) Metabolize a half of an introduced drug into the active metabolite
- c) Absorb a half of an introduced drug
- d) Bind a half of an introduced drug to plasma proteins
- e) Half of patients to get cured

24. What does "affinity" mean?

- a) A measure of how tightly a drug binds to plasma proteins
- b) A measure of how tightly a drug binds to a receptor
- c) A measure of inhibiting potency of a drug
- d) A measure of bioavailability of a drug
- e) Voltage required to stimulate muscles

25. If an agonist can produce maximal effects and has high efficacy it's called:

- a) Partial agonist
- b) Antagonist
- c) Agonist-antagonist
- d) Full agonist
- e) Protagonist

26. If an agonist can produce submaximal effects and has moderate efficacy it's called:

- a) Partial agonist
- b) Antagonist
- c) Agonist-antagonist
- d) Full agonist
- e) Protagonist

27. What does the term "chemical antagonism" mean?

- a) two drugs combine with one another to form an inactive compound
- b) two drugs combine with one another to form a more active compound
- c) two drugs combine with one another to form a more water soluble compound
- d) two drugs combine with one another to form a more fat soluble compound
- e) two drugs repelling each other in the mouth



28. What is a teratogenic effect?

- a) Toxic action on the liver
- b) Negative action on the fetus causing fetal malformation
- c) Toxic action on blood system
- d) Toxic action on kidneys
- e) Abnormal increase in weight due to drugs

29. What is the characteristic unwanted reaction unrelated to a dose or to a pharmacodynamic property of a drug called?

- a) Idiosyncrasy
- b) Hypersensitivity
- c) Tolerance
- d) Teratogenic action
- e) Biotransformation

30. Which of the following types of medicines was developed from cinchona, isolated from Cinchona calisaya?

- A) Antimalarial
- B) Anticancer
- C) Hypotensive
- D) Anti-inflammatory
- E) Antiarrhythmic

## **SECTION B**

31.a) Adenosine is ordered 12 mg IV after no response to a 6 mg dose. Adenosine is supplied 3g/L. How many mL will you need to give? (10 Marks)

b) A physician orders 200 mL of 0.9% Sodium Chloride be infused over one hour. You have an IV drip set that releases 10 drops. How many drops/ minute will you give? (10 Marks)

32. ADME corresponds to important pharmacokinetic principles. Write each letter in full and explain briefly each one using suitable examples. (20 Marks)