TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Applied & Health Sciences

DEPARTMENT OF MEDICAL SCIENCES

UNIVERSITY EXAMINATION FOR DIPLOMA IN:
PHARMACEUTICAL TECHNOLOGY (DPT 12J, M & S)

APM 2223: ORGANIC/INORGANIC PHARMACEUTICAL CHEMISTRY I

SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: JUNE 2015
TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination

- *Answer Booklet*

Answer **ALL** questions in section **A** & **B.** Choose any **TWO** questions in section **C**
This paper consist of **SEVEN** printed pages

SECTION A

1. ADME is an abbreviation in pharmacolcinetics for:
   A. Administration, Distribution, metabolism, excision
   B. Admission, Distribution, Metabolism, Excretion
   C. Absorption, Distribution, Metabolism, Excretion
   D. Absorption, Distribution, Metabolism, Excision

2. The major cite of metabolism is:
   A. The stomach
   B. The kidney
   C. The brain
   D. The liver

3. Which of the following is the classical and most reliable method of measuring pecutition coefficient?
   A. Electrochemical method
   B. Prediction
   C. Shake flasic method
   D. All of the above

4. Which of the following type of bounds is rare in drug receptor interactions:
   A. Ionic
   B. Polar-polar
   C. Covalent
   D. Hydrogen bonding

5. A drug which is protein bound is generally:
   A. Actine
   B. Innent
   C. Inactive
   D. Polar

6. Which of the following statement is true:
   A. Potency is more important than efficiency
   B. Efficacy is more important than potency
   C. Potency and efficacy and equally important
   D. None of the above

7. Type of compounds forming glucconicles are:
   A. Alcoholes and phenols
   B. Sulphhydryl compounds
   C. Aromatic and aliphatic carboxylic acids
   D. All the above

8. Phase II actylation reactions utilize:
   A. Co-enzyme B
   B. Acetyl co-enzyme A
   C. Conjugation enzyme A
   D. Conjugation enzyme B

9. Which of the following drugs was/were discovered without a lead (by chance)
    A. Lirium
    B. Chordiazepoxide
    C. Penicillin
    D. All of the above
    E. A and C above

10. The essential part of a drug:
    A. Governs pharmacodynamics of a drug
    B. Governs drug-receptor interactions
    C. Are known as bioattine functional groups
    D. Also known as pharamacophone
    E. All of the above

11. In homologation, increasing the length of a saturated side chain from one (CH3) to 5 to 9 atoms.
    A. Produces a decreased in pharmaconegic effect
    B. Produce an increase in pharmacologic effect
    C. Has no effect on activity
    D. None of the above

12. Which of the following constitutes classical bio-isostars:
    A. CI, Br, I
    B. CH_3; NH_2, OH & SHO
    C. – CH = ;-N
    D. All of the above

13. A producing oil
    A. An unmodified form of a crude drug with superior delivery systems
    B. A modified form of a drug with superior delivery properties
    C. All of the above
    D. None of the above

14. Castor oil
    A. Is a laxative because of its oily nature
    B. Is a source of fats and vitamins
    C. Is hydrolyzed intestinally to vicinoleic acid with laxature properties
    D. Is oxidized to vicinoleic acid

15. Which of the following constitutes drawbacks of a pro-drugs:
    A. They generate toxic metabolites
    B. Consume the protective glutamine during their consumption
    C. May alter pharmacodynamics of the parent drug by inducing metabolic enzymes or competing with it
    D. All of the above

16. Soft drug concept:
    A. Improves site specificity
    B. Improves transportability
    C. Improves pharmacokinetic insufficiencies
    D. All the above
    E. None of the above

17. What is the significance of SAR:
    A. Assists in discovery of new drugs
    B. Assists in taxonomy of compounds
    C. It assist in active ingredient identification
    D. All the above
    E. None of the above

18. Partition coefficient (KD) = The above structure represents:
    $\frac{[D]_N}{[D]_I}$
    A. $\frac{[D]_I}{[D]_N}$
    B. $CD]_W[D]_I$
    C.
    D. None of the above

19. An enzyme inducer
    A. Can lead to reduced drug levels
    B. Can lead to increased drug levels
    C. Both A and B
    D. None of the above

20. Drugs act via interaction with which of the following regulatory protections:
    A. Receptor proteins
    B. Ion channels
    C. Carriers
    D. Enzymes
    E. All of the above

21. In metabolic ….
    A. HCO3 excess
    B. CO2 decreased
    C. HCO3 deficit
    D. All of the above

22. The acid base balance in the body is maintained by:
    A. Blood buffer system
    B. Respiratory mechanism
    C. Renal mechanism
    D. All of the above

23. A weak base is:
    A. Completely ionized in water
    B. Partially ionized in water
    C. A and B
    D. None of the above

24. A neutral PH

$PH = 7$

A.

$\left[OH^{-1}\right] = 10^{-7}$

B.

$\left[H^{+}\right] = 10^{-7}$

C.

D. All of the above

25. The ionic water product KW is:
    A. 10^{-7}
    B. 10^{-14}
    C. 10^{7}
    D. 10^{14}

26. Portable water is:
    A. Purified water
    B. Water for injection
    C. Bottled water
    D. Water for drinking

27. Sterile water for injection should be:
    A. Slightly alkaline
    B. Residue on evaporation of not more than 6.3%
    C. Sterile
    D. All of the above

28. Buffer capacity is:
    A. Buffer value
    B. Buffer index
    C. Buffer action
    D. Both A and B

29. Which is not a pharmaceutical class of water:
    E. Portable water
    F. Purified water
    G. Sterile water for injection
    H. Demonized water

30. An acid-base indicator is:
    A. Strong base
    B. Strong acid
    C. A and B
    D. None of the above

31. Acute metabolic alkalosis may be corrected by:
    A. KCL
    B. $NaHCO_3$
    C. NaCl
    D. $CaCl_2$

32. Hydrogen peroxide is used as:
    A. Antiseptic
    B. Acidifying agent
    C. Protective agent

D. Antixidant

33. Impurities in pharmaceutical preparation may be due to:
    A. Raw materials
    B. Manufacturing process
    C. Chemical instability
    D. All of the above
34. Temporary hardness of water may be softened by:
    A. Boiling
    B. Clarks lime process
    C. Demonized water
    D. All of the above

35. According to Bronsted-lowing concept an acid is:
    A. Proton donor
    B. Electron donor
    C. Proton acceptor
    D. Electron acceptor

36. Permanent hardware may be softened by:
    A. Addition of soluble carbonate
    B. Polyphosphate chelation
    C. Zerolite
    D. All of the above

37. Arrhenius theory defines a base as:
    A. Proton donour
    B. Electron donor
    C. Proton acceptor
    D. None of the above

38. Which acid-base concept or theory defines an acid as an electron pair acceptor
    A. Arrhenius
    B. Lewis
    C. Bronsted lowing
    D. None of the above

39. Which of the following is the harderson-harslebalch equation

$$PH = PKa - \log\left[\frac{A^-}{H_A}\right]$$

A.

$$PH = PKa + \log\left[\frac{A^-}{H_A}\right]$$

B.
C. Both A and B
D. None of the above

40. A conjugate acid of a strong base is:
    A. Strong
    B. Weak
    C. Strong and weak
    D. None of the above

SECTION B

1. List FOUR methods of lead discovery

2. List FOUR approaches employed in optimization of the LEAD

3. (a) Define Distribution
   (b) What factors affect the distribution of a drug between tissues

4. (a) Define solubility
   (b) Define partition coefficient

5. (a) Define a pro-drug
   (b) Name TWO types of pro-drugs

6. Briefly describe the production of water for injection **(5 marks)**

7. Differentiate between purified water, sterile water for injection and water for injection **(6 marks)**

8. Briefly describe the Arrhearius theory of acids and bases **(5 marks)**

9. In brief describe the concept of conjugate parts **(4 marks)**

SECTION C (Answer any TWO questions)

1. Give the difference between competitive and non-competitive inhibitors **(20 marks)**

2. Discuss Drug metabolism, giving examples of the reactions involved **(20 marks)**

3. Describe the theories of Acids and Bases **(20 marks)**