



**TECHNICAL UNIVERSITY OF MOMBASA**  
**Faculty of Applied & Health**  
**Sciences**

DEPARTMENT OF MEDICAL SCIENCES

**DIPLOMA IN PHARMACEUTICAL TECHNOLOGY (DPT 12J)**

APM 2307: INORGANIC PHARMACEUTICAL CHEMISTRY III

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2014**

**TIME ALLOWED: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

Answer **ALL** questions

This paper consists of **NINE** printed pages

**Question One (Compulsory)**

1. Temporary hardness of  $H_2O$  may be softened by:
  - a) Boiling
  - b) Clarks lime process
  - c) Deionized water
  - d) All of the above
  
2. Hydrogen peroxide is used as:
  - a) Antiseptic
  - b) Acidifying agent
  - c) Protective
  - d) Antioxidant
  
3. Fluoride inhibits carries formation via:
  - a) ↓ Acid solubility of enamel
  - b) Bacterial inhibition
  - c) Both of the above
  - d) ↑ Acid solubility of enamel
  
4. Hydroxyapatite is a mixture  $Ca^{2+}$  salt of:
  - a)  $CO_3^{2-}$
  - b)  $PO_4^-$
  - c) OH
  - d) All of these
  
5. The body fluids found within the cells is called:
  - a) Plasma
  - b) Extracellular fluid
  - c) Water
  - d) Intracellular fluid
  
6. Blood plasma belongs to:
  - a) Intracellular fluid
  - b) Extracellular fluid
  - c) Intestinal fluid
  - d) Both B and C
  
7. Most solutes in body fluid are:
  - a) Electrolytes
  - b) Proteins
  - c) Amino acids
  - d) Liquids
  
8. Osmotic pressure is related to:
  - a) Number of particles in a solution
  - b) The size of particles in a solution
  - c) The weight of particles in a solute

- d) None of the above
9. The most important lattice in extracellular fluid is:
- Calcium
  - Sodium
  - Potassium
  - Magnesium
10. The THREE objectives of I.U therapy are:
- Maintenance, peristaltic and replacement therapy
  - Replacement, expansion and restoration therapy
  - Maintenance, replacement and restoration therapy
  - Restoration, hydration and dehydration therapy
11. What is the most commonly used multiple electrolyte solution:
- 5% dextrose in water
  - 0.9% NaCl
  - Lactated Ringer's solution
  - 5% dextrose and NaCl
12. The expected outcome of administering a hypertonic solution to:
- Shift ECF from intracellular space to plasma
  - Hydrate cells
  - Supply free H<sub>2</sub>O to vascular space
  - None of the above
13. Compounds capable of functioning as antimicrobial agent through oxidative mechanism are:
- H<sub>2</sub>O<sub>2</sub>
  - Halogen
  - KMnO<sub>4</sub>
  - All of the above
14. In Brownsted Lowry concept avoid is:
- Proton donor
  - Electron donor
  - Proton acceptor
  - Electron acceptor
15. Impurities in Pharmaceutical preparations may be due to the following sources:
- Raw materials
  - Manufacturing process
  - Chemical instability
  - All of the above
16. 8% stannous fluoride solution is applied:
- Once in a year
  - Twice in a year
  - Thrice in a year
  - Three applications at weekly intervals

17. Acidulated phosphate fluoride contains:
- 0.9% F<sup>-</sup>
  - 1.23% F<sup>-</sup>
  - 1.5% F<sup>-</sup>
  - 2.0 F<sup>-</sup>
18. Dental carries and periodontal disease are carried by:
- Dental plague
  - Pellicle
  - Calculus
  - Material alba
19. Repeated topical applications of concentrated fluoride agent will not produce tooth muffling because:
- The fluoride concentration of the solution is not strong enough
  - The applied fluoride is neutralized by calcium present in the saliva
  - It is not fluoride which produces the muffling seen in fluorosis
  - The tooth is already fully calcified and cannot be altered in this fashion
20. The optimum amount of fluoride in drinking water that does not produce muffling is:
- 0.1ppm
  - 1ppm
  - 0.01ppm
  - 2.1ppm
21. Para-amino phenol derivatives have:
- Analgesic activity
  - Anti inflammatory activity
  - Anti pyretic activity
  - a and b above
  - a and c above
22. The normal blood glucose level in humans range from:
- 70 – 90mg/100ml
  - 50 – 60mg/100ml
  - 40 – 70mg/100ml
  - None of the above
23. Ketonemia is:
- Increased production of urea in urine
  - Increased production of ammonia in urine
  - Increased production of icetone bodies in urine
  - All of the above
24. The acidic (A) chain of insulin contains;
- 21 Amino Acids
  - 30 Amino Acids
  - 51 Amino Acids
  - None of the above

25. Which of the following is not a limitation of insulin therapy
- In long term therapy, there is risk of tumor development at the site of injection
  - Local allergic reactions
  - Cannot lead to visual disturbances
  - Insulin resistance
26. Which of the following is radioactive iodine:
- $I^{140}$
  - $I^{130}$
  - $I^{151}$
  - $I^{131}$
27. Which of the following drugs is used in hypothyroidism:
- Thiouracil
  - Carbimazole
  - Thiourea
  - Levothyroxine sodium
  - None of the above
28. Which of the following drugs has positive inotropic effect:
- Nifedipine
  - Propranolol
  - Digitalis
  - Minoxidil
29. An example of a direct vasodilator drug is:
- Hydralazine
  - Nifedipine
  - Diltiazem
  - Lasix
30. The release of Aldosterone leads to:
- Excretion of  $Na^+$  and hence decrease in plasma volume
  - Retention of  $Na^+$  and hence increase in plasma volume
  - Retention of  $Na^+$  and hence decrease in plasma volume
  - Excretion of  $Na^+$  and hence increase in plasma volume
31. Loop diuretics are:
- The first choice (line) diuretics
  - Reserved and used when thiazide diuretics fail
  - Use interchangeably with thiazide diuretics
  - Good in sparing potassium
32. The commonest side effect of ACE inhibitors is:
- Headache
  - GI disturbances
  - Cough
  - Incontinence

33. Lipid lowering agents:
- Are soft in pregnancy
  - Have to be used at low doses during pregnancy
  - Are contraindicated in pregnancy
  - None of the above
34. HMG-CoA is:
- a potent lipid lowering drug
  - is a precursor of lipid lowering drugs
  - is an enzyme in cholesterol biosynthesis
  - is a by-product of lipid metabolism
35. Coumarins exert in vivo activity after 1 – 2 days because:
- They have to be metabolized into their active form in the body
  - They have a slow onset of action
  - They depress the synthesis of clotting factors
  - All of the above
36. Which of the following drugs is a coumarin derivative:
- Bromindione
  - Warfarin
  - Phenindione
  - All of the above
37. Drugs used in prevention of thrombi formation are known as:
- Antithrombolytics
  - Thrombolytics
  - Antithrombotic
  - Antilipidemics
38. Plasma expanders are divided into:
- Synthetic and natural expanders
  - Haematinics and tonics
  - Both a and b above
  - None of the above
39. Positive inotropic effect means:
- Decreasing the force of contraction of the myocardium
  - Increasing the force of contraction of the myocardium
  - Increasing the time of contraction of the myocardium
  - None of the above
40. Local anaesthetic drugs are also used as:
- Anti arrhythmic drugs
  - Antibiotics
  - Antihypertensives
  - Antidiuretics

41. Which of the following is a centrally acting antihypertensive agent?

- a) Nifedipine
- b) Minoxidil
- c) Methyldopa
- d) Digitalis

Use the figure below to answer questions 42 to 44

42. The figure represents:

- a) Carbonic acid derivatives
- b) Benzoic acid derivatives
- c) Salicylic acid derivatives
- d) Nicotinic acid derivatives

43. For Phenyl salicylate R<sub>1</sub> and R<sub>2</sub> must be:

- a) H and C<sup>6</sup>H<sup>5</sup>
- b) C<sup>6</sup>H<sup>5</sup> and CH<sup>3</sup>
- c) C<sup>6</sup>H<sup>5</sup> and H
- d) None of the above

44. For Acetyl salicylic acid, R<sub>1</sub> and R<sub>2</sub> must be:

- a) H and COOCH<sub>3</sub>
- b) COCH<sub>3</sub> and H
- c) H and COCH<sub>3</sub>
- d) None of the above

45. A salol is:

- a) An ether of two toxic substances
- b) An ester of two toxic substances
- c) A mixture of two toxic substance
- d) All of the above

46. Name the structure below:

- a) Z – pyrazolone
- b) 5 – pyrazolone
- c) Pyrazolidine
- d) Pyrazole

47. The derivatives of the above structure are known to have:

- a) Analgetic, antipyretic and antirheumatic activity
- b) Analgetic activity only

- c) Analgetic and antipyretic activity
  - d) None of the above
48. The three structural moieties in indomethacin are:
- a) P-chlorobenzoyl, indole and acetic acid
  - b) M-chlorobenzoyl, indole and ethanoic acid
  - c) O-chlorobenzoyl, indole and acetic acid
  - d) None of the above
49. Which of the following analgetic is a derivative of N- Arylanthranilic acid
- a) Ibuprofen
  - b) Mefenamic acid
  - c) Aspirin
  - d) Indocid
50. Allopurinol acts by:
- a) Increasing the formation of uric acid
  - b) Competitively antagonizing xanthine oxidase enzyme
  - c) All of the above
  - d) None of the above
51. The Adrenal cortex hormones are divided into:
- a) Glucocorticoids and mineralcorticoids
  - b) Progesterone and oestrogen
  - c) Androgens and anabolic agents
  - d) None of the above
52. Metformin is a preferred type II diabetes because:
- a) It promotes weight gain
  - b) It promotes modest weight reduction
  - c) It increases appetite
  - d) It is cheap drug
53. Type I diabetes is:
- a) An autoimmune disorder
  - b) Develops at old age
  - c) Disease of excess insulin
  - d) Treatable with oral agents
54. Which of the following opioid agent has antitussive effect:
- a) Morphine
  - b) Meperidine
  - c) Dextromethopharn
  - d) All of the above
55. True or false: Chronic administration of nalorphine along with morphine prevents the development of dependence:
56. The non-sugar portion of glycosides is also known as genin or aglycon



57. An arrhythmia may develop because of alteration of automaticity or conduction of myocardial cells
58. ACE inhibitors are considered the first step in drug therapy of congestive heart failure (CHF)
59. Haematinics are drugs used in treatment of iron deficiency.
60. Insulin is orally inactive

## SECTION B

1. Explain dental fluorosis and CES cause. (4 marks)
2. Explain the uses of buffers in the pharmacy. (4 marks)
3. Explain the meaning of 'electrolyte replemoghers. Give examples. (4 marks)
4. Write short notes on electrolytes in replacement therapy. (4 marks)
5. With examples, define acids on the basis of the following concepts: (4 marks)
- a) Arrhenius
  - b) Lewis
6. Draw the structure of testosterone. (3 marks)
7. Discuss briefly the (SAR) structure activity relationship of Acetylcholine. (4 marks)
- a) Give the two metabolites of acetanilide (1 mark)
  - b) Show their structures (3 marks)
8. Give FOUR uses of progesterone (therapeutic). (4 marks)
9. In the nomenclature of steroids, give the meaning of:
- a) Doted lines and solid lines (2 marks)
  - b) The meaning of the symbol D (2 marks)
10. Explain the role of theophylline attachments to organomercurals type of diuretics (4 marks)
11. Name FOUR types of acidifying agents
12. Name the FOUR structural features for the perfect fit of a narcotic analgesic on receptors (A, B, C , D) (4 marks)

## SECTION C

1. Discuss the structure activity relationship (SAR) of sulphonylureas using its basic structure:
2. Outline the SAR of histamine
3. Discuss the following:
- (i) Hyponatremia
  - (ii) Hypokalemia

- (iii) Tonicity of solutions
- (iv) Hypocalcaemia