Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF **MEDICAL SCIENCES**

DIPLOMA IN PHARMACEUTICAL TECHNOLOGY
(DPT 12S)

AMD 2104 : MEDICAL BIOCHEMISTRY I

SPECIAL/SUPPLEMENTARY: EXAMINATIONS

SERIES: July 2013

TIME: 2 HOURS

INSTRUCTIONS:

You should have the following for this examination

- *Answer booklet*

This paper consists of THREE sections A, B and C.
Answer all questions in section A and B and choose THREE out of FIVE questions in section C.

This paper consists of 8 PRINTED pages

SECTION A (40MARKS)

1. Which of the following is a triose sugar
   a) Ribose
   b) Erythrose
   c) Fructose
   d) Glycerose

2. Polysaccharides are
   a) Polymers
   b) Acids
   c) Oils
   d) Proteins

3. A polysaccharide which is often called animal starch is
   a) Glycogen
   b) Starch
   c) Inulin
   d) Dextrin

4. Sucrose consists of
   a) Glucose + Glucose
   b) Glucose + fructose
   c) Glucose + galactose
   d) Glucose + mannose

5. Which of the following is an epimeric pair ?
   a) Glucose and fructose
   b) Glucose and galactose
   c) Galactose and mannose
   d) Lactose and maltose

6. Amylose is a constituent of
   a) Starch
   b) Glycogen
   c) Cellulose
   d) None of these

7. Proteins contain
   a) Only L. Amino acids
   b) Only D-amino acids
   c) DL amino acids
   d) Both (A) and (B)

8. An aromatic amino acid is
   a) Lysine
   b) Tyrosine
   c) Taurine
   d) Arginine

9. Fibrous proteins have axial ration of
   a) Less than 10
   b) Less than 10
   c) Generally 10
   d) Greater than 10

10. The protein present in hair is
   a) Keratin
   b) Elastin
   c) Myosin
   d) Tropocollagen

11. An essential amino acid in man is
   a) Aspartate
   b) Methnionine
   c) Tyrosine
   d) Serine

12. The number of amino acid residues contained in a α-helix turn are
   a) 3.6
   b) 4.2
   c) 3.0
   d) 4.5

13. In proteins the α-helix and β-pleated sheets are examples of
   a) Primary structure
   b) Secondary structure
   c) Tertiary structure
   d) Quaternary structure

14. The α-helix of protein is
   a) A pleated structure
   b) Made periodic by disulphide bridges
   c) A non-periodic structure
   d) Stabilized by hydrogen bonds between NH and CO groups of the main chain

15. The neutral amino acid is
    a) Lysine
    b) Proline
    c) Leucine
    d) Histidine

16. Side chains of all amino acids contain an aromatic ring except
    a) Phenylalanine
    b) Alanine
    c) Tyrosine
    d) Trytophan

17. Isoelectric pH of an amino acid is that pH at which it has a
    a) Positive charge
    b) Negative charge
    c) No net charge
    d) None of these

18. Protein is a polymer of
    a) Sugars
    b) Phenols
    c) Amino acids
    d) Carboxylic acids

19. The number of double bonds in arachidonic acid is
    a) 1
    b) 4
    c) 2
    d) 6

20. All of the following have 18 carbon atoms except
    a) Linoleic acid
    b) Linolenic acid
    c) Stearic acid
    d) Arachidonic acid

21. Factor affecting enzyme activity are
    a) Concentration
    b) pH
    c) Temperature
    d) All of these

22. An example of enzyme inhibition is
    a) Reversible inhibition
    b) Allosteric inhibition
    c) Irreversible inhibition
    d) All of these

23. The enzyme hexokinase is a
    a) Hydrolase
    b) Oxidoreductase
    c) Transferase
    d) Ligase

24. In competitive inhibition the inhibitor
    a) Competes with the enzyme
    b) Irreversibly binds with the enzyme
    c) Binds with the substrate
    d) Competes with the substrate

25. Which of the following is not a ketose
    a) Xylulose
    b) Ribulose
    c) Ribose
    d) Fructose

26. Multiple forms of the same enzyme are known as
    a) Zymogens
    b) Isoenzymes
    c) Proenzymes
    d) Pre-enzymes

27. An enzyme is a
    a) Carbohydrate
    b) Lipid
    c) Protein
    d) Nucleic acid

28. An organic substance bound to an enzyme and is essential for the activity of the enzyme is called
    a) Holoenzyme
    b) Apoenzyme
    c) Coenzyme
    d) Isoenzyme

29. Which of the following inactivates an enzyme by occupying its active site?
    a) Competitive inhibitor
    b) Allosteric inhibitor
    c) Non-competitive inhibitor
    d) All of these

30. The part of an enzyme which combines with non-protein part to form a functional enzyme is
    a) Apoenzyme
    b) Coenzyme
    c) Prosthetic group
    d) None of these

31. Enzymes bring about
    a) Decrease in reaction time
    b) Increase in reaction time
    c) Increase in activation energy
    d) Reduction in activation energy

32. Which of the following is not an essential fatty acid
    a) Oleic acid
    b) Arachidonic acid
    c) Linoleic acid
    d) Linolenic acid

33. Sphingomyelins are composed of fatty acids , phosphoric acid and
    a) Sphingosine and choline
    b) Glycerol and sphingosine
    c) Glycerol and serine
    d) Glycerol and choline

34. Lipids have the following properties
    a) Insoluble in water and soluble in fat solvent
    b) High energy content
    c) Structural component of cell membrane
    d) All of these

35. Prostaglandins have a common structure based on prostanoic (arachidonic) acid which contains carbon atoms
    a) 12
    b) 16
    c) 18
    d) 20

36. Cerebrosides may also be classified as
    a) Sphingolipids
    b) Sulpholipids
    c) Amino lipids
    d) Glycolipids

37. The number of double bonds in arachidonic acid is
    a) 1
    b) 4
    c) 2
    d) 6

38. In mammalian cells RNA is produced mainly in the
    a) Endoplacmic reticulum
    b) Ribosome
    c) Nucleolus
    d) Nucleus

39. The power house of the cell is
    a) Nucleus
    b) Cell membrane
    c) Mitochondria
    d) Lysosomes

40. Glucose on oxidation does not give
    a) Glucoside
    b) Glucosaccharic acid
    c) Gluconic acid
    d) Glucuronic acid

SECTION B (Answer ALL questions)

41. Highlight FOUR functions of carbohydrates
42. Draw TWO structures of each of the following
    a) Aromatic amino acids
    b) Acidic amino acids
43. Outline FOUR biological importance of terpenes
44. Outline FOUR characteristics of living organisms
45. Proteins are sometimes referred to as " workhorses" explain this statement giving examples
46. Draw structures of the following
    a) Anomers of glucose
    b) An aldotriose and ketotriose
47. Define a peptide and list down any three peptides.
48. Outline FOUR characteristics of enzymes
49. Outline FOUR reactions of amino acids
50. List FOUR functions of phospholipids

SECTION C (60marks)

51. Discuss all the factors that affect the rate of enzyme catalyzed reactions
52. Discuss on the classification of amino acids
53. Describe the structure and functions of a named eukaryotic cell
54. Discuss on sugar derivatives, giving examples
55. Describe the classification of lipids and their biological significance of lipids