



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MEDICAL SCIENCES

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN PHARMACEUTICAL TECHNOLOGY

MEDICAL BIOCHEMISTRY I AMD 2105

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 2 HOURS

DATE: Pick Date Dec 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **THREE** Section(s). Attempt All questions in section A and B and any two questions in section C.

Circle the correct answer in section A.

Section A

1. Enzymes are that speed up the rate of biochemical reactions.

a. Physiological catalyts

b. Biological catalyts

c. Catalyts

d. Pharmacological catalyts

2. The region that binds substrates is the

a. Site

b. Active site

c. Ligand

d. Pro-ligand

3. The non-protein molecule that carries out chemical reactions that can't be performed by standard amino acids is

- a. Factor
- b. Co-factor
- c. Co-protein
- d. Co-enzyme

4. The inorganic molecules required for the proper activity of enzymes is

- a. Co-factor
- b. Inorganic co-factor
- c. Organic co-factor
- d. Factor

5. An enzyme having its co-factor removed is designated

- a. Holoenzyme
- b. Apo enzyme
- c. Enzyme
- d. Co enzyme

tum

6. The complete complex of a protein with all the necessary small organic molecules, metal ions and other components is

- a. Apo enzyme
- b. Holoenzyme
- c. Cofactor
- d. Factor

7. The reactant in a biochemical reaction is

- a. Enzyme
- b. Substrate
- c. Apo enzyme
- d. Cofactor

8. The esters of fatty acids are

- a. Complex lipids

b. Simple lipids

c. Miscellaneous lipids

d. Derived lipids

9. Gangliosides are

a. Derived lipids

b. Complex lipids

c. Miscellaneous lipids

d. Simple lipids

10. Neutral fat is also known as

a. Waxes

b. Triacylglycerols

c. Glycolipids

d. Phospholipids

11. The polar head group in sphingomyelin contains

a. Phosphatidylcholine

b. Phosphocholine

c. Phosphoenolcholine

d. Phosphophenol

12. All the following are classes of enzymes EXCEPT:-

a. Oxidoreductases

b. Transferases

c. Dehydratase

d. Lyases

13. Among the following, all are complex phospholipids EXCEPT:-

a. Phosphatidylcholine

b. Phosphatidylceramides

c. Phosphatidylethanolamine

d. Phosphatidylinositol

14. Ceramides are an example of

- a. Glycerophospholipid
- b. Sphingolipid
- c. Glycolipid
- d. Sterol

15. Wax esters, sterol esters and triacylglycerol are all

- a. Complex lipids
- b. Simple lipids
- c. Derived lipids
- d. Glycerophospholipids

16. Cerebrosides and Gangliosides are all examples of

- a. Sphingolipids
- b. Glycolipids
- c. Derived lipids
- d. Complex lipids

tum

17. Lipids that are stored in adipocytes in animals or endosperm and cotyledon in plants are

- a. Triacylglycerol
- b. Storage lipids
- c. Glycerophospholipids
- d. Fatty acids

18. Octadecadienoic acid is an 18 carbon fatty acid with bonds.

- a. One double
- b. Two double
- c. Three double
- d. Four double

19. Solubility in water of fatty acids is lowered by

- a. Longer chains, more double bonds
- b. Longer chains, fewer double bonds

- c. Shorter chains, more double bonds
- d. Shorter chains, fewer double bonds

20. Isomers with curved configuration are the

- a. cis
- b. trans
- c. bis
- d. linear

21. Most of the cholesterol is synthesized by the

- a. Lungs
- b. Kidneys
- c. Skin
- d. Liver

22. All the following are synthesized from cholesterol EXCEPT:-

- a. Vitamin D
- b. Hormones
- c. Vitamin E
- d. Bile acids

tum

23. The following are all functions of vitamins EXCEPT:-

- a. Hormone-like functions
- b. Regulation of cell and tissue growth
- c. Oxidants
- d. Enzyme co-factors

24. The lipid soluble vitamin is

- a. Vitamin B1
- b. Vitamin B12
- c. Vitamin C
- d. Vitamin K

25. Biologically active forms of vitamin A are all the following EXCEPT:-

- a. Retinol
- b. Retinal
- c. Retinoic acid
- d. Retinic acid

26. Alanine transaminase is an enzyme whose concentration increases in

- a. Liver disorders
- b. Myocardial infarctions
- c. Prostrate carcinoma
- d. Pancreatitis

27. Acid phosphatase is used in the following diagnosis of

- a. Prostate carcinoma
- b. Myocardial infection
- c. Bone disorders
- d. Brain tumors

28. Statin drugs such as Lipitor compete with HMG CoA (substrate) and inhibit the active site of HMG CoA reductase. This is an example of

- a. Non-competitive inhibition
- b. Competitive inhibition
- c. Mixed inhibition
- d. Irreversible inhibition

29. Most enzymes exhibit optimal activity at pH values of

- a. 3 and 9
- b. 4 and 9
- c. 6 and 9
- d. 5 and 9

30. Transferases are involved in reactions that

- a. More chemical groups
- b. Reduction – oxidation reactions
- c. Non – hydrolytic bond cleavage

d. Intramolecular group transfer

31. Enzymes synthesized and retained within the cell itself are referred to as

a. Extracellular

b. Intracellular

c. Co-factor

d. Apo enzyme

32. A group tightly bound to organic co-factor is

a. Co-enzyme

b. Prosthetic group

c. Apo enzyme

d. Holoenzyme

33. The amino acid that is artificial sweetener is

a. Methionine

b. Lysine

c. Aspartame

d. Cysteine

tum

34. The vitamin with hormone like functions as regulators of mineral metabolisms is

a. Vitamin A

b. Vitamin E

c. Vitamin c

d. Vitamin D

35. The vitamin with antioxidant activity is

a. Vitamin A

b. Vitamin E

c. Vitamin B

d. Vitamin D

36. Night blindness results from a deficiency of

a. Vitamin A

- b. Vitamin B
- c. Vitamin C
- d. Vitamin D

37. Enzyme that converts retinol to retinal is

- a. Retinaldehyde hydrogenase
- b. Retinol dehydrogenase
- c. Retinoldehyde dehydrogenase
- d. Retinol hydrogenase

38. The vitamin whose absorption is dependent of the presence of lipids is

- a. Vitamin A
- b. Vitamin E
- c. Vitamin C
- d. Vitamin D

39. Thiamine is vitamin

- a. B1
- b. B3
- c. B5
- d. B7

40. Vitamin B12 is referred to as

- a. Cobalamin
- b. Biotin
- c. Niacin
- d. Folic acid

tum

SECTION B:

ANSWER ALL QUESTIONS

41. Draw a graph that shows the effects of temperature on enzymes (4 marks)
42. Classify the types of inhibition (4 marks)
43. Outline the factors that affect enzyme activity (4 marks)
44. Describe the Michaelis-Menten equation (4 marks)
45. List the 8 essential amino acids (4 marks)
46. List the Lipid soluble vitamins (4 marks)
47. List dietary sources of vitamin A (4 marks)
48. Outline the functions of vitamin D (4 marks)
49. List the names of vitamin B1, B2, B3 and B5 (4 marks)
50. Outline the physical properties of monosaccharides (4 marks)

SECTION C

ANSWER ALL QUESTIONS

51. a) Outline the characteristics of enzymes (6marks)
 - b) List with examples the classes of enzymes (6marks)
 - c) Discuss the factors affecting rate of enzyme catalysed reactions (8marks)
-
52. a) Outline the B vitamins together with their chemical names (8marks)
 - b) Discuss the deficiencies that arise from lack of vitamins A,D,K and C (12marks)