SECOND YEAR BSC OPTOMETRY

BIOCHEMISTRY-QUESTION BANK/ANSWERKEY

ESSAYS (10 MARKS)

1. Classify carbohydrates. Mention the steps of glycolysis
   Classification of carbohydrates with example (5).Steps of glycolysis (5)

2. What is the normal pH of blood? Explain how it is maintained in the body by buffers.
   Normal blood pH (1). Buffer system(9)

3. What is gluconeogenesis? Describe the steps of gluconeogenesis.
   Definition (2). Steps of gluconeogenesis(8)

4. Explain the sources, daily requirement, biochemical functions and deficiency manifestation of vitamin D
   Sources (1), daily requirement(1), functions(4),deficiency manifestation(4)

5. Explain the important buffer systems in regulating the body PH
   Buffer –definition(1),three buffer system(9)

6. Classify fatty acids and discuss the beta oxidation of fatty acid
   Classification (2),definition of beta oxidation(1)steps(5)regulation(1),energetics(1)

7. Mention the different types of diabetes mellitus and write the metabolic derangement in Diabetes mellitus
   Types of diabetes mellitus(4),metabolic derangements(6)

8. Explain the functions of carbohydrates and discuss the glycolytic pathway
   Five functions(5),glycolytic pathway(5)

9. What is the normal blood glucose level? Discuss the regulation of blood glucose
   Normal level(1),regulation by hormones (9)

10. Discuss the disturbances in acid base balances

Definition (2),Acidosis(4),alkalosis(4)

11. Discuss gluconeogenesis- definition, substrates, reactions, energetics and significance.
    Gluconeogenesis –definition(1),Substrates(1)reactions(5)energetics(1)significance(2)

12. Describe the sources, daily requirements, biochemical functions and deficiency manifestation of vitamin A.
    Sources (1), daily requirements(1),functions(5)deficiency manfestations(3)

13. Explain the normal blood PH. Discuss the role of plasma buffers and kidney in maintaining acid-base balance
    Normal blood PH (1), regulation by buffer system(5),regulation by kidney(4)

14. Outline the pathway of heme synthesis and add a note on porphyrias.
    Heme synthesis pathway(7), porphyrias (3)

15. What are enzymes? Discuss the different factors affecting enzyme activity.
    Enzymes –definition(3), 7 factors affecting enzymes(7)

16. Discuss the regulation of extracellular water volume. Add a note on water intoxication
    Regulation of water balance(5),water intoxication(5)

17. Discuss the regulation of blood PH within normal limits. Add a note on assessment of acid base disorders using arterial blood gas analysis.
    Regulation of blood PH (8),assessment of acid base disorder using ABG(2)

18. Define gluconeogenesis. Trace the pathway of gluconeogenesis from lactate.
    Gluconeogenesis –definition(2),steps of gluconeogenesis(8)

SHORT NOTES (5 MARKS)

1. Common disturbances in acid- base balance.
   Acid base disturbances-definition(1)types(4)

2. Define nitrogen balance and mention the different types with examples

Nitrogen balance- definition, types, factors affecting nitrogen balance(5)

3. Serum lipid profile

   Lipid profile-different parameters , normal values and important (5)

4. Enumerate the different live r function test and function that is being tested

   Five tests(2.5),five functions(2.5)

5. Immunoglobulins

   Immunoglobulins-definition and types (5)

6. Dietary fibers

   Dietary fibers-definition, important(5)

7. Heme synthesis

   Heme synthesis-(5)

8. Classification of enzymes

   Six classes of enzymes with example(5)

9. Regulation of blood glucose

   Regulation of blood glucose by 5 hormones(5)

10. Fluid mosaic model of cell membrane

    Fluid mosaic model of cell membrane(5)

11. Lipoproteins

    Five lipoproteins (5)

12. Regulation of blood PH

    Regulation of blood pH-buffer system, respiratory mechanism, renal regulation(5)

13. Rickets

    Rickets –vitamin deficient, deficiency manifestation(5)

14. Functions of liver
    Five functions of liver(5)

15. Structure and function of cholesterol
    Structure (2),3 functions of cholesterol(3)

16. Significances of HMP shunt pathway
    Five significance of HMP pathway(5)

17. Renal mechanism of regulation of blood PH
    Renal mechanism of regulation of blood pH (5)

18. Enzyme profile in acute myocardial infarction
    Enzyme profile in acute MI(5)

19. Metabolic acidosis
    Metabolic acidosis-definition ,compensatory mechanism(5)

20. Functions of proteins
    Five functions of proteins(5)

21. Abnormal constituents in urine
    Any five abnormal constituents in urine(5)

22. Regulation of sodium and electrolyte balance
    Regulation of sodium(2.5) ,electrolyte balance(2.5)

23. IUBMB classification of enzymes
    6 classes of IUBMB classification with example(5)

24. Regulation of blood calcium level
    Regulation of blood calcium level(5)

25. Porphyrias
    Porphyria –definition, types (5)

26. Fatty acid enzyme synthase complex
    Fatty acid synthase complex (5)

27. Functions of kidney
    Five functions of kidney(5)

28. Classification of lipids
    Classification of lipids(5)

29. Long term monitoring of diabetes mellitus
    Long term monitoring of DM-HBA1C(5)

30. Structure and functions of bio membrane
    Structure(2), 3 functions of bio membrane(3)

31. Different types of enzyme inhibition with suitable examples
    Types of inhibition with example(5)

32. Important substances derived from glycine
    Important substances derived from glycine(5)

33. Biochemical tests to differentiate different types of jaundice
    Tests to differentiate different types of jaundice(5)

34. Structure of proteins with example
    Primary,secondary, tertiary and quaternary structure with example(5)

35. Lipoproteins and their significance
    Five lipoproteins and their significance(5)

36. Metabolic derangements in diabetes mellitus
    Carbohydrate, protein and lipid derangements in DM(5)

37. Phenylketonuria
    Phenylketonuria-definition, deficient enzyme, types and symptoms(5)

38. Classification of enzymes
    Six classes of enzymes with example(5)

39. Functions and deficiency manifestation of thiamine
    Functions (2.5),deficiency manifestation(2.5)

40. Any three enzyme assays useful in the diagnosis of liver diseases
    Three enzyme assays with clinical significance(5)

41. Metabolic acidosis and metabolic alkalosis
    Metabolic acidosis(2.5),metabolic alkalosis(2.5)

42. Homeostasis of blood calcium
    Homeostasis of blood calcium(5)

43. Deficiency manifestation of vitamin D
    Vitamin D deficiency manifestation(5)

44. Role of chylomicrons in lipid transport in the body.
    Role of chylomicrons in lipid transport(5)

45. Beta oxidation of fatty acids
    Beta oxidation-definition , reactions, regulation and energetics(5)

46. Competitive enzyme inhibition
    Competitive enzyme inhibition with example(5)

47. Secondary structure of proteins
    Secondary structure of proteins(5)

48. Absorption of dietary iron from the gut
    Absorption of dietary iron from gut –mechanism(5)

49. Metabolic derangements in a case of untreated diabetes mellitus
    Carbohydrate, protein and lipid derangement (5)

50. Biochemical functions of vitamin A
    Any five functions of vitamin A(5)

ANSWER BRIEFLY (3 MARKS)

1. Classification of lipids
   Classification of lipids(3)

2. Reduction reactions of carbohydrate and its application
   Reduction reaction (1.5), application (1.5)

3. Formation of serotonin in the body
   Formation of serotonin (3)

4. Laboratory diagnosis of hepatic jaundice
   Laboratory diagnosis of hepatic jaundice (3)

5. Biomarkers of myocardial infarction
   Any three biomarkers of MI (3)

6. Peptide bond
   Peptide bond (3)

7. Beriberi
   Beriberi –vitamin deficient, three types (3)

8. Role of renin-angiotensin-aldosterone system on water and sodium metabolism
   Role of angiotensin(1.5),aldosterone system(1.5)

9. Any two tests to assess the function of kidney
   Two tests to assess the function of kidney(3)

10. General structure of lipoproteins
    Structure of lipoprotein(3)

11. Acute intermittent porphyria
    Acute intermittent porphyria-cause, clinical manifestations(3)

12. Biological role of folic acid
    Any three biological role of folic acid(3)

13. Role of buffers in the regulation of normal blood PH
    Role of three important buffers in the regulation of blood pH(3)

14. Fatty acid transport across inner mitochondrial membrane
    Fatty acid transport- carnitine transport system(3)

15. HDL is a good cholesterol fraction. Explain
    HDL –Reverse cholesterol transport(3)

16. Laboratory diagnosis of diabetes mellitus
    Laboratory diagnosis of DM- Fbs,PPbs ,GTT (3)

17. Suicide enzyme inhibition
    Suicide inhibition with example(3)

18. Phenylketonuria
    Phenylketonuria-cause, clinical manifestations(3)

19. Substrates of gluconeogenesis
    Any three substrates of gluconeogenesis(3)

20. Zinc
    Zinc-Sources, RDA, function and deficiency manifestation(3)

21. Competitive inhibition of enzymes
    Competitive inhibition of enzyme with example(3)

22. HDL cholesterol
    HDL cholesterol-function and clinical significance(3)

23. Absorption of iron

    Absorption of iron(3)

24. Functions of vitamin K

    Any three functions of vitamin K(3)

25. Polyunsaturated fatty acid

    Polyunsaturated fatty acid-definition ,function and significance(3)

26. Functions of selenium

    Any three functions of selenium(3)

27. Secondary structure of proteins

    Secondary structure of proteins(3)

28. Essential amino acids

    Essential amino acids-definition with example(3)

29. Proteinuria

    Proteinuria-definition and clinical conditions associated with proteinuria (3)

30. Enzymes used to assess liver function

    Any three enzymes used to assess liver function(3)

31. Biochemical functions of zinc

    Any three biochemical functions of zinc(3)

32. Functions of niacin

    Any three functions of niacin(3)

33. Bicarbonate as a buffer

    Bicarbonate as buffer-mechanism(3)

34. Complications of diabetes mellitus

    Any three complications of diabetes mellitus(3)

35. Fatty acid synthase complex

    Fatty acid synthase complex(3)

36. Reducing substances in urine

    Any three reducing substances in urine(3)

37. Albinism

    Albinism –definition, enzyme deficient, symptoms(3)

38. Respiratory acidosis

    Respiratory acidosis(3)

39. Enzyme profile in myocardial infarction

    Any three enzymes in MI(3)

40. Give the normal serum level of urea,creatinine and potassium

    Normal level of urea, creatinine and potassium(3)

41. Homocystinuria

    Homocystinuria –definition, enzyme deficient and symptoms(3)

42. Functions of vitamin C

    Any three functions of vitamin C(3)

43. Metabolic functions of vitamin B12

    Any three functions of vitamin B12(3)

44. Factors affecting enzyme activity

    Any three factors affecting enzymes(3)

45. Degradation of heme

    Degradation of heme(3)

46. The normal serum level of potassium,sodium and calcium

    The normal level of potassium, sodium and calcium(3)

47. Bile salts

    Bile salts(3)

48. Glycated hemoglobin

    Glycated hemoglobin(3)

49. Creatinine clearance test

    Creatinine clearance test(3)

50. Oxygen dissociation curve

    Oxygen dissociation curve(3)

51. Metabolic alkalosis

    Metabolic alkalosis(3)

52. Urinary findings in different types of jaundice

    Urinary findings in different types of jaundice(3)

53. The normal serum level of potassium,cholesterol and albumin

    The normal serum level of potassium, cholesterol and albumin(3)

54. Selenium

    Selenium –sources, RDA, function and deficiency manifestation(30)

55. Anion gap

    Anion gap(3)

56. Rothera's test

    Rothera's test(3)

57. Arterial blood gas analysis

    Arterial blood gas analysis(3)

58. Metabolic functions of pyridoxine

    Any three functions of pyridoxine(3)

59. Classification of enzymes
    Six classes of enzymes(3)

60. The normal serum level of sodium, creatinine and total protein
    The normal level of sodium, creatinine and total protein(3)

61. Nutritional importance of lipids
    Any three nutritional importance of lipids(3)

62. Liver function test
    Liver function test-3 tests(3)

63. Biochemical changes seen and causes of metabolic acidosis
    Biochemical changes seen and causes of metabolic acidosis(3)

64. Normal value of common six electrolytes in blood
    Normal value of common six electrolytes in blood(3)

65. Enumerate the renal function test, the functions tested and significance
    Enumerate the renal function test(1),the functions tested(1) and significance(1)

66. Niacin
    Niacin –sources, RDA, functions and deficiency manifestations(3)

67. Benedict's test
    Benedict's test(3)

68. Compounds formed from tyrosine
    Any three compounds formed from tyrosine(3)

69. Lipid profile
    Lipid profile-different tests(3)

70. Riboflavin
    Riboflavin- sources, RDA, functions and deficiency manifestations(3)

71. What is the normal blood urea level? What is the significance of estimation of blood urea level

    Normal blood urea level(1).The significance of estimation of blood urea(2)

72. Phospholipids

    Phospholipids (3)

73. Biochemical functions of thiamine

    Any three functions of thiamine(3)

74. Nitrogen balance

    Nitrogen balance-definition, types and factors affecting nitrogen balance(3)

75. Renal function test

    Renal function test-3 tests(3)

76. Vitamin C

    Vitamin C-Sources, RDA, function and deficiency manifestation(3)

77. Significance and normal value of different cardiac markers

    Significance and normal value of different cardiac markers(3)

78. Nutritional importance of carbohydrates

    Any three nutritional importance of carbohydrates(3)

79. Changes and causes of respiratory acidosis

    Changes and causes of respiratory acidosis(3)

80. Glucometer

    Glucometer (3)

81. Nutritional importance of proteins

    Any three nutritional importance of proteins(3)

82. Immunoglobulins

    Immunoglobulin-definition and types (3)

83. Name the vitamins

Name the vitamins-water soluble vitamins and fat soluble vitamins(3)

84. Mention six abnormal constituents of urine and how are they qualitatively detected

Mention six abnormal constituents of urine and how they are qualitatively detected(3)

Prepared By

Mrs. MANJULA

Guest Lecturer

Biochemistry