ENTRANCE EXAMINATION FOR ADMISSION, MAY 2013.

M.Sc. (MEDICAL BIOCHEMISTRY)

COURSE CODE : 502

Register Number : [ ]

Signature of the Invigilator
(with date)

COURSE CODE : 502

Time : 2 Hours Max : 400 Marks

Instructions to Candidates :

1. Write your Register Number within the box provided on the top of this page and fill in the page 1 of the answer sheet using pen.
2. Do not write your name anywhere in this booklet or answer sheet. Violation of this entails disqualification.
3. Read each of the question carefully and shade the relevant answer (A) or (B) or (C) or (D) in the relevant box of the ANSWER SHEET using HB pencil.
4. Avoid blind guessing. A wrong answer will fetch you –1 mark and the correct answer will fetch 4 marks.
5. Do not write anything in the question paper. Use the white sheets attached at the end for rough works.
6. Do not open the question paper until the start signal is given.
7. Do not attempt to answer after stop signal is given. Any such attempt will disqualify your candidature.
8. On stop signal, keep the question paper and the answer sheet on your table and wait for the invigilator to collect them.
9. Use of Calculators, Tables, etc. are prohibited.

1. Basic amino acids are
   (A) Aspartate and glutamate (B) Serine and glycine
   (C) Lysine and arginie (D) None of the above

2. Amino acid with dissociation constant closest to physiological pH is
   (A) Serine (B) Histidine (C) Threonine (D) Proline

3. Sources of the nitrogen in urea cycle are
   (A) Aspartate and ammonia (B) Glutamate and ammonia
   (C) Arginine and ammonia (D) Uric acid

4. If urine sample darkens on standing: the most likely condition is
   (A) Phenylketonuria (B) Alkaptonuria
   (C) Maple syrup disease (D) Tyrosinemia

5. A baby presents with refusal to feed, skin lesions, seizures ketosis organic acids in urine with normal ammonia; likely diagnosis is:
   (A) Proprionic aciduria (B) Multiple carboxylase deficiency
   (C) Maple syrup urine disease (D) Urea cycle enzyme deficiency

6. Force not acting in an enzyme substrate comoplex
   (A) Electostatic (B) Covalent (C) Van der waals (D) Hydrogen

7. Cellular oxidation is inhibited by
   (A) Cyanide (B) Carbon dioxide
   (C) Chocolate (D) Carbonated beverages

8. Triple bonds are found between which base pairs
   (A) A – T (B) C – G (C) A – G (D) C – T

9. Which of the following RNA has abnormal purine bases?
   (A) tRNA (B) mRNA (C) rRNA (D) 16S RNA

10. False regarding gout is
   (A) Due to increased metabolism of pyrimidines
   (B) Due to increased metabolism of purines
   (C) Uric acid levels may not be elevated
   (D) Has a predilection for the great toe

11. All of the following statements are true regarding lipoproteins except
    (A) VLDL transports endogenous lipids
    (B) LDL transports lipids to the tissues
    (C) Increased blood cholesterol is associated with increased LDL receptors
    (D) Increased HDL is associated with decreased risk of coronary disease.

12. A destitute woman is admitted to the hospital with altered sensorium and dehydration; urine analysis shows mild proteinuria and no sugar; what other test would be desirable
    (A) Fouchet (B) Rothera (C) Hays (D) Benedicts

13. Which of these fatty acids is found exclusively in breast milk?
    (A) Linolaete (B) Linolenic
    (C) Palmitic (D) Dicosahexanoic acid

14. Blood is not a Newtonian fluid because
    (A) Viscosity does not changing with velocity
    (B) Viscosity changes with velocity
    (C) Density does not change with velocity
    (D) Density changes with velocity

15. Most non polar Amino Acid is
    (A) Leucine (B) Glycine (C) Arginine (D) Lysine

16. Aminoacyl t-RNA is required for all except
    (A) Hydroxyproline (B) Methionine
    (C) Cystine (D) Lysine

17. The Similarity between Vit. C and Vit. K is
    (A) Both help in conversion of proline to hydroxyproline
    (B) Both help in post-translational modification
    (C) Both have anti infective acitivity
    (D) Both are involved in coagulation cascade

18. The primary defect in Xeroderma pigmentosa is
    (A) Formation of thymidine dimmers
    (B) Poly ADP ribose polymerase is defective
    (C) Exonuclease I defective
    (D) Formation of adenine dimmers

19. Null mutation is
(A) Mutation occurring in Non Coding region.
(B) Mutation that does not change the amino acid or end product
(C) Mutation that codes for a change inprogeny without any chromosomal change
(D) Mutation that leads to no functional gene product

20. The hormone using an enzyme receptor for its action:
(A) Insulin (B) Steroid (C) Oestrogen (D) Thyroxine

21. In chymotrypsine molecule, if serine – 195 is substituted for alanine then
(A) Chymotrypsin will not bind to substrate but will cleave the substrate
(B) Chymotrypsin will bind but will not cleave
(C) Chymotrypsin will neither bind to substrate nor cleave
(D) Chymotrypsin will bind and cleave both

22. Pyruvate can be converted directly into all the following except
(A) Phosphoenol pyruvate (B) Alanine
(C) Acetyl CoA (D) Lactate

23. The rate-limiting enzyme in Glycolysis is
(A) Phosphofructokinase (B) Glucose-6-dehydrogenase
(C) Glucokinase (D) Pyruvate kinase

24. All are actions of insulin except
(A) Gluconeogenesis (B) Glycolysis
(C) Glycogenesis (D) Lipogenesis

25. Insulin does not facilitate glucose uptake n the following except
(A) Liver (B) Heart (C) RBC (D) Kidney

26. Which helps in the transport of chylomicrons from intestine to liver?
(A) Apoprotein B (B) Apoprotein A (C) Apoprotein C (D) Apoprotein E

27. Mechanism of action of Nitric oxide is through
(A) cGMP (B) cAMP (C) Ca++ (D) Tyrosine

28. DNA fragments formed by the action of Restriction Endonucleases, are separated by
(A) Gel electrophoresis
(B) Agarose gel electrophoresis
(C) Paper Chromatography
(D) High pressure liquid chromatography

29. Regarding a crystal, the true statement is
(A) Molecules are arranged in same orientation with different confirmation
(B) Molecules are arranged in different orientation with different confirmation
(C) Molecules are arranged in same orientation and same confirmation
(D) Molecules are arranged in different orientation but with same confirmation

30. Regarding Newtonian force, true is
(A) Viscosity is directly proportional to velocity
(B) Viscosity is inversely proportional to velocity
(C) Viscosity is equal to the velocity
(D) There is no relation between the two

31. Optically inactive Amino Acid is
(A) Proline (B) Glycine (C) Lysine (D) Leucine

32. True statement regarding Nitric oxide is
(A) NO is synthesized from arginine
(B) NO is spontaneous produced from No_2
(C) NO causes vasoconstriction
(D) NO is released from mitochondria

33. Thiamine acts as a cofactor in
(A) Conversion of pyruvate to acetyl-CoA
(B) Transamination reactions
(C) Oxidation in respiratory chain
(D) Conversion of pyridoxal to pyridoxal phosphate

34. Following constitute dietary fibres except
(A) Pectin (B) Cellulose (C) Hemicellulose (D) Riboflavin

35. Which of the following aminoacid is exreated in urine in maple syrup urine disease?
(A) Tryptophan (B) Phenylalanine (C) Leucine (D) Arginine

36. Ammonia is detoxified in brain to
(A) Urea (B) Glutamine (C) GABA (D) Uric acid

37. Gaucher's disease in due to deficiency of enzyme
(A) Sphingomyelinase (B) βGlucosidase
(C) Hexosaminidase-A (D) βGalactosidase

38. Glucose can be synthesized from all of the following except
(A) Acetoacetate (B) Lactic Acid (C) Glycerol (D) Amino Acid

39. True about polymerase chain reaction is
(A) Enzymatic DNA amplification
(B) Recombinent DNA amplification
(C) Seperation of protein fragments is serum
(D) None

40. Translation occurs in
(A) Ribosomes (B) Mitochondria (C) Nucleus (D) Cytoplasm

41. Gout is a disorder of
(A) Purine metabolism (B) Pyrimidine metabolism
(C) Oxalate metabolism (D) Protein metabolism

42. Best enzyme marker for chronic alcoholism is
(A) Gamma glutamyl-transferase (B) SGOT
(C) SGPT (D) Aldolase

43. In cytochrom P – 450, P stands for
(A) Structural protein (B) Polymer
(C) Substrate protein (D) Pigment

44. Dietery cholesterol is delivered transported to extra hepatic tissue by
(A) VLDL (B) LDL (C) Chylomicrons (D) IDL

45. Leucine is a aminoacid with a
(A) Nonpolar side chain (B) Polar side chain
(C) Negatively charged side chain (D) Postively charged side chain

46. Most basic amino acid out of the following is
(A) Alanine (B) Arginine (C) Histidine (D) Lysine

47. Transmination of pyruvate with glutamate produces
(A) Oxaloacetate and aspartate (B) Alanine and aspirate
(C) Oxaloacetate and α-ketoglutarate (D) Alanine and α-ketoglutarate

48. Selenium is co-factor for
(A) Glutathione peroxidase
(B) Glutathione reductase
(C) Glutathione synthetase
(D) Glutathione dehydrogenase

49. Mallate shuttle is seen to occur in
(A) Glycolysis
(B) Glycogenolysis
(C) HMP shunt
(D) Gluconeogenesis

50. Glucose may be synthesized from
(A) Glycerol (B) Adenine (C) Guanine (D) Palmitic acid

51. NADPH is required for
(A) Gluconeogenesis
(B) Glycolysis
(C) Fatty acids synthesis
(D) Glycogenolysis

52. If chymotrypsin molecule undergoes a ser-195-alamutation then
(A) Chymotrypsin will not bind the substrate
(B) Chymotrypsin will bind the substrate as well as cause cleavage
(C) Chymotrypsin will bind the substrate but will not cause cleavage
(D) No affect will be observed

53. Apoprotein A is found in
(A) Chylomicrons (B) VLDL (C) HDL (D) LDL

54. Endogenous triglycerides in plasma are maximally carried in
(A) VLDL (B) Chylomicrons (C) LDL (D) HDL

55. All of the following statements are correct about metabolism in brain except
(A) Fatty acids are utilized in starvation
(B) 60% of total energy is utilized during resting stage
(C) Ketone bodies are used in starvation
(D) Has no stored energy

56. Which enzyme involved in translation is often referred to as "Fidelity enzyme"?
(A) DNA polymerase
(B) RNA polymerase
(C) Amino acyl-tRNA synthetase
(D) Amino acyl-reductase

57. Okazaki segments are required for
(A) DNA synthesis
(B) RNA synthesis
(C) Protein synthesis
(D) None of the above

58. DNA restriction is done by the following method

(A) Paper chromatography (B) Electrophoresis agargel method

(C) Spectrophotometer (D) Spectrometry

59. Strongest bond out of the following is

(A) Electostatic (B) Hydrogen (C) Hydrophobic (D) Vanderwall's

60. Which of the following molecular phenomenon in I_g genes is responsible for affinity maturation of antibody response?

(A) Chain shuffling (B) Junctional diversity

(C) Somatic hypermutation (D) Altered RAA splicing

61. Cyclic GMP act on

(A) Insulin (B) Thyroxin

(C) A trial natriuretic peptide (D) Growth harmone

62. True statement regarding covalent bonds is

(A) Electrons have same spin (B) Electrons have opposide spin

(C) They are weak bonds (D) None of the above

63. Vitamin required for post translational modification of coagulants is

(A) Vitamin A (B) Vitamin C

(C) Vitamin B_6 (D) Vitamin K

64. Enzyme to both common in gluconegenesis and glycolysis pathway is

(A) Phosphofructokinase (B) Fructose 2, 6 – biphosphatase

(C) Hexokinase (D) Glucose 6 phosphatase

65. The major fate of glucose-6 Phosphate in tissue in a well fed state is

(A) Hydrolysis to glucose (B) Conversion to glycogen

(C) Isomerization to fructose 6 phosphate (D) Conversion to ribulose 5 phosphate

66. Gluconeogensis affect A/E

(A) Lactate (B) Glycerol

(C) Alanine (D) Growth hormone

67. Property of photochromosity is seen amongst the following amino acids

(A) Unsaturated aminoacid (B) Aromatic aminoacid

(C) Monocarboxylic acid (D) Dicarboxylic acid

68. All of the following are required for hydroxylation of proline in collagen synthesis except

(A) O_2 (B) Vitamin C

(C) Dioxygenases (D) Pyridoxal phosphate

69. The cellular component for protein synthesis is

(A) Smooth endoplasmic reticulum (B) Rough endoplasmic reticulum

(C) Ribosomes (D) Mitochondria

70. Binding of proteins to DNA is regulated by

(A) Copper (B) Zinc (C) Selenium (D) Nickle

71. RNA seen in

(A) Spinal muscular dystrophy (B) Sickle cell disease

(C) Hutchinson chorea (D) α Thallasemia

72. Restriction endonuclease is

(A) Break single stranded DNA (B) Break double stranded DNA

(C) Break peptide chain (D) Break RNA

73. The most important carrier of cholesterol in plasma is

(A) Chylomicrons (B) HDL (C) VLDL (D) LDL

74. A Protein estimation test is confused with

(A) Phosphates (B) Nitrates (C) Sulphates (D) Bile salts

75. Furasol DA is

(A) Free radical

(B) Artificial blood

(C) CO antagonist

(D) Used to increase O_2 delivery to tissue

76. Dietary fibre contains

(A) Colalgen (B) Pectin (C) Proteoglycans (D) Starch

77. Biotins act on

(A) Carboxylation (B) Oxidative phosphorylation

(C) Oxidative deamination (D) Transmethylation

78. Vitamin B_{12} is absorbed in the
(A) Stomach (B) Duodenum (C) Ileum (D) Colon

79. Cofactor associated with the enzyme Glutathione peroxidase is
(A) Zinc (B) Cadmium (C) Molybdenum (D) Selenium

80. Strongest bond amongst the following is
(A) Hydrophobic (B) Elctrostatic
(C) Hydrogen bond (D) Wan der wall's

81. Gluconeogenesis occurs in all except
(A) Glycerol (B) Amino acid (C) Lactic acid (D) Palmitate

82. Apoprotein A is found in
(A) Chylomicrons (B) VLDL (C) HDL (D) LDL

83. Amino acid which lacks chirality is
(A) Lysine (B) Leucine (C) Histidine (D) Glycine

84. An amino acid which does not participate by □ helix formation is
(A) Leucine (B) Glycine (C) Proline (D) Lysine

85. Trans-amination of pyruvate and glutamic acid leads to the formation of
(A) Oxaloacetate (B) α -ketoglutarate
(C) Aspartate (D) Malate

86. Which form of DNA is predominantly seen?
(A) A (B) C (C) B (D) Z

87. Thermo-stability in DNA is contributed mostly by
(A) A = T (B) G = C
(C) Molecular base (D) Parallel arrangement

88. Okazaki fragment helps in
(A) DNA replication (B) Translation
(C) Protein synthesis (D) Transcription

89. Bromodeoxyuridine is related to DNA in
(A) Uracil (B) Adenosine (C) Cytosine (D) Thymidine

90. The first step in fatty acid synthesis involves
(A) Acetyl CoA carboxylase (B) β Hydroxyl CoA dehydrogenase
(C) Acetyl dehydrogenase (D) Pyruvate kinase

91. Which of the following is a denaturing substance?
(A) Guanosine (B) Guanidine (C) Glutamate (D) Glycine

92. A marker of Golgi apparatus is
(A) Galactosyl transferase (B) Acetyl CoA synthetase
(C) Pyruvate kinase (D) Malonyl CoA

93. In hemoglobin, iron is bound to
(A) Histidine (B) Leucine (C) Isoleucine (D) Vaine

94. Fluoride inhibits which enzyme
(A) Pyruvate kinase (B) Succinyl dehydrogenase
(C) Enolase (D) Aldolase

95. Metabolites in HMP shunt are all except
(A) Glycerol-3 phosphate (B) Sedoheptulose-7 phosphate
(C) Glyceraldehyde-3 phosphate (D) Xylulose-5 phosphate

96. NADPH is used in
(A) Fatty acid synthesis (B) Ketone synthesis
(C) Gluconeogenesis (D) Glycolysis

97. The most essential fatty acid is
(A) Linoleic acid (B) Linolenic acid (C) Arachidonic acid (D) Palmitic acid

98. Rate limiting enzyme in the synthesis of cholesterol is
(A) HmG CoA reductase (B) HmG CoA synthetase
(C) Acetyl CoA synthetase (D) Acetyl CoA carboxylase

99. If starvation exceeds 7 days, the major nutritional supply of the brain comes from
(A) Fatty acids (B) Ketone bodies
(C) Protein breakdown (D) Carbohydrate breakdown

100. Cell shape and motility are provided by
(A) Microfilaments (B) Microtubules
(C) Golgi apparatus (D) Mitochondria