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Ph.D. ENTRANCE EXAMINATION - 2020

Subject : Biochemistry

Date : 06.01.2020

Max Marks: 60

Duration: 01:30 Hrs.

Place : Dehradun

Student Name:

Invigilator Name:

Signature:

Signature:

- 1. Two Vitamin whose derivatives are involved in transformation of serine to glycine are:**
 - a. B₆ and B₁₂
 - b. B₁₂ and nicotinamide
 - c. Folic acid and B₆
 - d. Folic acid and B₁₂

- 2. Which vitamin is synthesized by intestinal bacteria?**
 - a. Vit B
 - b. Vit A
 - c. Vit D
 - d. Vit K

- 3. Which vitamin is related to a co-factor in glycine metabolism is:**
 - a. Vit E
 - b. Folic acid
 - c. Thiamine
 - d. Cobalamine

- 4. Biological activity of tocopherols has been attributed, in part to their actions as:**
 - a. Antioxidant
 - b. Anticoagulants
 - c. Provitamin
 - d. Antidotes for selenium poisoning

- 5. Vitamin C is present in largest amount in the body in:**
 - a. Eye
 - b. Kidneys
 - c. Testes
 - d. Adrenal cortex

- 6. The following vitamin is important in non-oxidative decarboxylation, transamination and transsulfuration reactions:**
 - a. Riboflavin
 - b. Thiamine
 - c. Pyridoxine
 - d. Pantothenic acid

- 7. Most of vitamin B₁₂ in the body is stored as:**
 - a. Methyl B₁₂
 - b. Hydroxy B₁₂
 - c. Cyano cobalamine
 - d. None of the above

- 8. Beri-beri is caused due to the deficiency of:**
 - a. Thiamine
 - b. Pyridoxine
 - c. Ascorbic acid
 - d. Riboflavin

- 9. Which of the following is not true of Vit D?**
 - a. Its active form is calcitriol
 - b. Increase calcium absorption from the intestines
 - c. Its deficiency results in rickets
 - d. Its decrease cause phosphate reabsorption from the kidneys

10. The action of vitamin K in formation of clotting factor is through:

- a. Post transcription
- b. **Post translation**
- c. Golgi complex
- d. Endoplasmic reticulum

11. Specific disease caused by vitamin B₁ deficiency

- a. Pellagra
- b. Angular cheilitis
- c. Megaloblastic anemia
- d. **Peripheral polyneuritis**

12. Deficiency of vitamin A causes the following except:

- a. Night blindness
- b. Corneal dryness
- c. Bitot's spots
- d. **Myopia**

13. Active form of vitamin D in kidney is:

- a. 1 dihydroxy cholecalciferol
- b. 25 hydroxy cholecalciferol
- c. **1,25 dihydroxy cholecalciferol**
- d. 7 dihydroxy calciferol

14. Tertiary structure of protein is maintained by all except:

- a. H₂ bond
- b. Hydrophobic
- c. Ionic bond
- d. **None of the above**

15. Which of the following is a derived protein:

- a. Protamines
- b. **Peptones**
- c. Prolamines
- d. Lactalbumin

16. Quaternary structure of protein is:

- a. The arrangement sequence of amino acids in the polypeptide chain
- b. Inter relation between amino acids in a single polypeptide chain
- c. Inter relation of amino acids in 2 polypeptide chains
- d. **The inter relation and arrangement of polypeptides in a protein with more than 2 polypeptide chains**

17. Indole ring is present in:

- a. **Tryptophan**
- b. Valine
- c. Methionine
- d. Histidine

18. The following is false about tryptophan:

- a. **Non essential amino acid**
- b. Involved in serotonin synthesis
- c. Involved in niacin synthesis
- d. Involved in melatonin synthesis

19. Non essential amino acids are not:

- a. Used by the body
- b. Forming part of the proteins
- c. Required in the diet
- d. Absorbed in the intestines

20. The major fuel for the brain after several weeks of starvation:

- a. Glucose
- b. Fatty acid
- c. Beta hydroxy butyrate
- d. Glycerol

21. One of the following is nonessential amino acid:

- a. Tyrosine
- b. Valine
- c. Methionine
- d. Cystine

22. The process by which a base sequence of messenger RNA is synthesized (by a RNA polymerase) on a template of complementary DNA is called:

- a. Transcription
- b. Transduction
- c. Translation
- d. Translocation

23. Hydroxylation of proline require the following except:

- a. Fe^{+2}
- b. O_2
- c. Ascorbic acid
- d. Succinate

24. The process of transfer of information from the RNA to the proteins is called:

- a. Mutation
- b. Translation
- c. Transcription
- d. Conjugation

25. The amino acid, which is used in the estimation of collagen is:

- a. Hydroxyproline
- b. Proline
- c. Lysine
- d. Glycine

26. Which of the following is present in the plasma but absent in the serum?

- a. Albumin
- b. Globulin
- c. Lecithin
- d. Fibrinogen

27. Synthesis of protein occurs on:

- a. Mitochondria
- b. Poly ribosomes
- c. Nucleus
- d. Golgi bodies

28. Which of the following amino acids is quickly converted to tyrosine?

- a. Arginine
- b. Glycine
- c. Phenylalanine
- d. Leucine

29. Alkaptonuria, an inherited metabolic disorder of L-tyrosine metabolism is due to lack of:

- a. Parahydroxy phenyl pyruvate Hydroxylase
- b. Tyrosine transaminase
- c. Homogentisate oxidase
- d. Tyrosine oxidase

30. During phagocytosis, the metabolic process called respiratory burst involves the activation of:

- a. Oxidase
- b. Hydrolase
- c. Peroxidase
- d. Dehydrogenase

31. Heme is converted to bilirubin mainly in:

- a. Kidney
- b. Liver
- c. Spleen
- d. Bone marrow

32. Fatty acid oxidation occurs in:

- a. Cytoplasm
- b. Microsomes
- c. Mitochondria
- d. All of the above

33. Which of the following fatty acids are not synthesized in human body:

- a. Oleic, linoleic and linolenic acid
- b. Arachidonic, linolenic and linoleic acid
- c. Palmitic, Oleic and arachidonic
- d. Linoleic, arachidonic and stearic acid

34. A fatty acid that is not synthesized in man is:

- a. Linoleic acid
- b. Oleic acid
- c. Palmitic acid
- d. Stearic acid

35. The lipoprotein particles that have the highest percentage concentration of cholesterol is:

- a. Chylomicron
- b. VLDL (Very low density lipoprotein)
- c. LDL (Low density lipoprotein)
- d. HDL (High density lipoprotein)

36. Fat provides ___% of body's calories

- a. 40%
- b. 30%
- c. 50%
- d. 75%

37. The major lipids that make up the cell membrane are:

- a. Triglycerides
- b. Phospholipids
- c. Sphingomyelins
- d. Fatty acids

38. The following is not a phospholipid:

- a. Sphingomyelin
- b. Lecithin
- c. Cerebroside
- d. Cephalin

39. Which of the following is a phospholipid:

- a. Glycogen
- b. Sphingomyelin
- c. Prostaglandin
- d. Oleic acid

40. In Niemann-Pick's disease the following substance accumulate in CNS in excess:

- a. Glycerophosphatides
- b. Phosphoinositides
- c. Phosphosphingosides
- d. Glycerosphingosides

41. The lipid, which accumulates in fatty liver, is:

- a. Triglycerides
- b. FFA
- c. Lipoprotein
- d. Cholesterol

42. The product of oxidation of odd chainfatty acids is:

- a. Aceto acetyl CoA
- b. Malonyl CoA
- c. Propionyl CoA
- d. Fumaryl CoA

43. The ketone bodies, which are excreted in diabetic ketoacidosis?

- a. Acetoacetic acid and pyruvic acid
- b. Acetoacetic acid and oxalocacetic acid
- c. Acetoacetic acid and alpha ketoglutaric acid
- d. Acetoacetic acid and beta hydroxyl butyric acid

44. The precursor of cholesterol synthesis is:

- a. Acetic acid
- b. Acetyl CoA
- c. Oxalo acetic acid
- d. Pyruvate

45. Which is not seen in HMG CoA pathway?

- a. Pyruvate
- b. Cholesterol
- c. Mevalonate
- d. Acetyl CoA

46. Lipid from tissue is carried to liver by:

- a. LDL
- b. VLDL
- c. HDL
- d. Chylomicrons

47. Detoxification of drugs is controlled by:

- a. Cytochrome
- b. Cytochrome P450
- c. Cytochrome C
- d. Cytochrome A

48. In Cytochrome p450, P stands for:

- a. Structural proteins
- b. Substrate proteins
- c. Pigment
- d. Polyme

49. Detoxification or protective synthesis occurs by:

- a. Oxidation
- b. Reduction
- c. Conjugation
- d. Any of the above

50. Which of the following about biological membrane is true?

- a. Lipid moiety is amphipathic
- b. Rigid assembly of protein, lipid and carbohydrate
- c. Symmetrical bi leaflet structures
- d. Lipid and protein moiety are held by covalent interactions

51. The major driving force for formation of membrane lipid bilayer is:

- a. Hydrogen bonding
- b. Hydrophobic interactions
- c. Vander wall forces
- d. Not known

52. Normal blood PH is:

- a. 6.8 - 7.0
- b. 7.0 - 7.12
- c. 7.38 - 7.4
- d. 7.7 - 8.0

53. The most important buffer in RBC is:

- a. O_2 Hb +Na hemoglobinate
- b. O_2 Hb +K hemoglobinate
- c. H_2CO_3 + $KHCO_3$
- d. H_2CO_3 + $NAHCO_3$

54. To keep blood PH at 7.4 the $\text{HCO}_3^- : \text{H}_2\text{CO}_3$ ratio should be:

- a. 20 : 1
- b. 30 : 1
- c. 15 : 1
- d. 1 : 1

55. In ECF main electrolyte is:

- a. Na^+
- b. K^+
- c. Cl^-
- d. Proteins

56. Most important compensatory mechanism in metabolic acidosis:

- a. Hyperventilation
- b. Increased NH_3 excretion by kidneys
- c. Increased urinary phosphates
- d. Increased HCO_3^- Production

57. The main function of mitochondria is:

- a. Protein synthesis
- b. Oxidation
- c. Electron transfer
- d. Fat synthesis

58. Which cell organelle contains DNA

- a. Mitochondrion
- b. Golgi body
- c. Endoplasmic reticulum
- d. Centriole

59. Cell membrane consists of:

- a. Lipids and proteins
- b. Lipids only
- c. Protein only
- d. None of the above

60. Golgi bodies function are:

- a. Protein lipid synthesis
- b. Protein synthesis
- c. Sorting of glycoproteins
- d. None of the above
