BIOCHEMISTRY Topic list of End-Semester Exam

Faculty of General Medicine, 2nd year 1st semester

1. Chemical nature of enzymes, general properties of proteins
2. Classification of enzymes; isoenzymes
3. Coenzymes
4. Enzymatic catalysis - general concepts and the molecular mechanism of catalysis
5. Enzyme kinetics
6. Allostery; multienzyme complexes
7. Modulation and regulation of enzyme activity
8. High-energy compounds and the thermodynamics of the living system
9. Digestion and absorption of carbohydrates, pathobiochemical aspects, uptake to the cells (GLUT)
10. Steps of glycolysis
11. Energy generation in glycolysis and its regulation
12. Interrelationship of glycolysis to other metabolic pathways
13. Gluconeogenesis
14. Glycogenolysis, regulation of glycogen metabolism, pathobiochemical aspects
15. Glycogenesis and lactose synthesis
16. Pentose phosphate pathway (hexose monophosphate shunt) and formation of glucuronides, pathobiochemical aspects
17. Hexose interconversion, metabolism of galactose, pathobiochemical aspects
18. Metabolism of fructose, pathobiochemical aspects
19. Structure and synthesis of glycoproteins
20. Digestion and absorption of lipids, transport (metabolism of lipoproteins), pathobiochemical aspects
21. Storage and mobilization of triacylglycerols
22. Anabolism of fatty acids
23. Catabolism of fatty acids
24. Energy balance of fatty acid degradation, regulation of fatty acid metabolism, pathobiochemical aspects
25. Ketone bodies, pathobiochemical aspects
26. Metabolism of phospholipids
27. Metabolism of sphingolipids, pathobiochemical aspects
28. Synthesis of cholesterol and pathobiochemical aspects of hypercholesterolemia
29. Formation and importance of compounds derived from cholesterol, pathobiochemical aspects
30. Metabolism of unsaturated fatty acids, importance of biologically active compounds (eicosanoids), pathobiochemical aspects
31. Digestion and absorption of proteins, pathobiochemical aspects

32. Amino acid breakdown: the fate of the amino groups, importance of glutamine and asparagine
33. Urea cycle
34. Biosynthesis of non-essential amino acids (Ala, Asp, Asn, Cys, Gly)
35. Biosynthesis of non-essential amino acids (Glu, Gln, Pro, Ser, Tyr)
36. Catabolism of the carbon skeletons of amino acids: pyruvate group (Ala, Ser,Gly, Cys, Thr)
37. Catabolism of the carbon skeletons of amino acids: oxaloacetate and succinyl-CoA group (Asp, Asn and Met, Ile, Val; importance of vitamin B_{12}), pathobiochemical aspects
38. Catabolism of the carbon skeletons of amino acids: alpha-ketoglutarate group (Glu, Gln, Arg, Pro, His), pathobiochemical aspects
39. Catabolism of the carbon skeletons of amino acids: acetyl-CoA group (Phe, Tyr, Ile, Leu, Trp, Lys), pathobiochemical aspects
40. Biochemical importance of one-carbon units, production and use of one-carbon groups, characterization and importance of THF, pathobiochemical aspects
41. Conversion of glycine to specialized products
42. Conversion of serine to specialized products
43. Conversion of methionine and cysteine to specialized products, SAM and its role in biosynthesis, pathobiochemical aspects
44. Conversion of arginine and histidine to specialized products
45. Conversion of tryptophan to specialized products
46. Conversion of glutamate to specialized products
47. Compounds derived from phenylalanine, pathobiochemical aspects
48. Glutathione and its importance, transport of amino acids, protection against the oxidative stress, pathobiochemical aspects
49. Porphyrin synthesis, pathobiochemical aspects
50. Bile pigments, pathobiochemical aspects
51. Synthesis of purine nucleotides, pathobiochemical aspects
52. Catabolism of purine nucleotides; salvage pathways, pathobiochemical aspects
53. Synthesis and breakdown of pyrimidine nucleotides
54. Synthesis of deoxyribonucleotides (characterization of thioredoxine system)
55. Compounds influencing the nucleotide metabolism, their clinical importance and pathobiochemical aspects
56. Individual steps of the citric acid cycle and its regulation
57. Relationship between the citric acid cycle and other metabolic pathways
58. Structure of mitochondria; mitochondrial transport systems
59. Respiratory chain; energetics and inhibitors, pathobiochemical aspects
60. Mechanism of oxidative phosphorylation, pathobiochemical aspects