

BIOCHEMISTRY

Topic list of End-Semester Exam Faculty of Pharmacy 2014/15 2nd semester

1. Thermodynamics of biochemical pathways, macroerg compounds
2. Functions of proteins in the living organism, the chemical nature of proteins, formation and characterization of three dimensional structure of proteins
3. General characteristics of enzyme action. Molecular mechanism of enzyme catalysis
4. Coenzymes and their actions
5. Classification of enzymes
6. Isoenzymes, multienzyme systems, units of enzyme activity
7. Enzyme regulation
8. Kinetics of enzyme reactions
9. Citric acid cycle, its regulation and importance
10. Electron transport chain; its energetics and inhibitors
11. Oxidative phosphorylation, effects of uncouplers
12. Glycolysis and its regulation
13. Glycogenesis and glycogenolysis , their regulation
14. Gluconeogenesis, hexose monophosphate shunt
15. Relationship between the carbohydrate metabolism and other metabolisms
16. Degradation of fatty acids and its energy balance
17. Synthesis of saturated fatty acids, eicosanoids
18. Synthesis and degradation of neutral lipids and phospholipids
19. Synthesis and transport of cholesterol
20. Lipoprotein metabolism
21. Ketone bodies
22. Hormonal regulation of blood glucose level, biochemical consequence of diabetes mellitus
23. Removal of amino acid nitrogen
24. Urea cycle and its importance
25. The fate of the carbon skeleton of amino acids
26. The role of amino acids in the synthesis of functional compounds containing nitrogen
27. Source, transport and utilization of C₁ groups
28. Metabolism of nucleotides, participation in the synthesis of biologically functional compounds
29. Diseases associated with abnormal nucleotide metabolism, compounds influencing on the nucleotide metabolism. Drugs influencing nucleotide metabolism.
30. Structure and function of biological membrane, dynamics of membrane components
31. Transport across the membrane
32. Types and importance of signaling pathways
33. Involvement of signaling pathways in the regulation of metabolism

34. The role of liver in the metabolism
35. Mechanism of biotransformation
36. Biochemical effects of alcohols
37. Blood plasma proteins and their functions
38. Biochemistry of red blood cells, molecular mechanism of oxygen transport
39. Biochemistry of leukocytes
40. Biochemical base of blood clotting and fibrinolysis
41. The role of quantitative composition of nutrients, macronutrients
42. The role of quantitative composition of nutrients, micronutrients and dietary fibres
43. Metabolism of central nervous system
44. Neurotransmitter receptors and the forms of synaptic transmission
45. Synthesis and inactivation of neurotransmitter
46. Fibrillar proteins of extracellular matrix, types and characteristics of proteoglycans
47. Components of cytoskeleton and their importance, importance of cell adhesion
48. Metabolism and energy source of muscle, muscle diseases. Molecular mechanism and regulation of muscle contraction
49. Biochemistry of hypothalamo and hypophyseal hormone system
50. Hormon synthesis in thyroid gland, biochemical effect of thyroid hormones, and Ca^{++} homeostasis
51. Synthesis of steroid hormones and their effects
52. The structure of DNA, the structure of chromosome, euchromatin, heterochromatin, regulation of transcription, enhancer, silencer, the difference between prokaryotic and eukaryotic gene expression
53. RNA types, RNA polymerases, the transcription process, maturation of mRNA, mechanism of splicing, tissue specific and development dependent splicing, antisense RNA
54. Regulation of metabolism at the organ level: metabolic adaptation in stress, physical exercise, pregnancy, lactation
55. Regulation of metabolism at the organ level: metabolic adaptation in starvation and well-fed state