B.Sc., BIOCHEMISTRY

W.E.F – 2016-17

Semester - IV

THEORY: BCT- 401 INTERMEDIARY METABOLISM

60 HRS

(5 periods/week)

Unit- I : Carbohydrate Metabolism **12 hours**

Concept of anabolism and catabolism. Glycolytic pathway, energy yield. Fate of pyruvate- formation of lactate and ethanol, Pasteur effect. Citric acid cycle, regulation, energy yield, amphipathic role. Anaplerotic reactions. Glycogenolysis and glycogenesis. Pentose phosphate pathway. Gluconeogenesis. Photosytnthesis- Light and Dark reactions, Calvin cycle, C_4 Pathway. Disorders of carbohydrate metabolism- Diabetes Mellitus.

Unit- II: Lipid Metabolism **12 hours**

Catabolism of fatty acids (β- oxidation) with even and odd number of carbon atoms, Ketogenesis, *de novo* synthesis of fatty acids, elongation of fatty acids in mitochondria and microsomes, Biosynthesis and degradation of triacylglycerol and lecithin. Biosynthesis of cholesterol. Disorders of lipid metabolism.

Unit- III: Metabolism of Amino acids **12 hours**

General reactions of amino acid metabolism- transamination, decarboxylation and deamination, Urea cycle and regulation, Catabolism of carbon skeleton of amino acids- glycogenic and ketogenic amino acids. Metabolism of glycine, serine, aspartic acid, methionine, phenylalanine and leucine. Biosynthesis of creatine. Inborn errors of aromatic and branched chain amino acid metabolism.

Unit- IV: Nitrogen Fixation **12 hours**

Nitrogen cycle, Non-biological and biological nitrogen fixation, Nitrogenase system. Utilization of nitrate ion, Ammonia incorporation into organic compounds. Synthesis of glutamine and regulatory mechanism of glutamine synthase.

Unit- V: Metabolism of Nucleic acid and heme: **12 hours**

Biosynthesis and regulation of purine and pyrimidine nucleotides, *de novo* and salvage pathways. Catabolism of purines and pyrimidines. Biosynthesis of deoxyribonucleotides- ribonucleotide reductase and thymidylate synthase and their significance. Disorders of nucleotide metabolism- Gout, Lesch- Nyhan syndrome.Biosynthesis and degradation of heme.

Practical – BCP-401: Quantitative Analysis

45 hrs

(3 periods/week)

List of Experiments:

1. Estimation of amino acid by Ninhydrin method.
2. Estimation of protein by Biuret method.
3. Estimation of protein by Lowry method.
4. Estimation of glucose by DNS method.
5. Estimation of glucose by Benedict's titrimetric method.
6. Estimation of total carbohydrates by Anthrone method.

MODEL QUESTION PAPER FOR END SEMESTER EXAM
B.Sc Degree Course
(Semester-IV) Intermediary Metabolisms

B.Sc Biochemistry

Timer: 3hrs **Max marks: 75**

Section-A (5X5=25 marks)

Attempt any **Five** of the following

1. Nitrogen cycle
2. Utilisation of nitrate
3. Transamination.
4. Gout.
5. Pentose phosphate pathway.
6. C_4 pathway.
7. Ketogenesis.
8. Phenylketonuria.

Section-B (5X10=50 marks)

Attempt all the following questions

9. Explain the biochemical reactions in C_3 pathway.

(OR)

10. How TCA cycle is considered as amphibolic pathway.

11. Explain the biochemical events in β-oxidation of fatty acids.

(OR)

12. Describe the biosynthetic pathway of cholesterol.

13. What is the fate of aromatic aminoacids during catabolism.

(OR)

14.Explain the biochemical steps involved in urea cycle.

15. Write an essay on the biological nitrogen fixation.

(OR)

16. Steps involved in the synthesis and regulation of glutamine synthase.

17. Explain the biochemical reactions in purine nucleotides biosynthesis.

(OR)

18. Write an essay on the disorders of nucleotide metabolism.

MODEL QUESTION PAPER FOR END SEMESTER EXAM
B.Sc Degree Course
(Semester-IV) Intermediary Metabolisms

B.Sc Biochemistry

Timer: 3hrs **Max marks: 75**

Section-A (5X5=25 marks)

Attempt any **Five** of the following

1. Nitrogen cycle
2. Utilisation of nitrate
3. Transamination.
4. Gout.
5. Pentose phosphate pathway.
6. C_4 pathway.
7. Ketogenesis.
8. Phenylketonuria.

Section-B (5X10=50 marks)

Attempt all the following questions

9. Explain the biochemical reactions in C_3 pathway.

(OR)

10. How TCA cycle is considered as amphibolic pathway.

11. Explain the biochemical events in β-oxidation of fatty acids.

(OR)

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