MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR

B. Sc. BIOTECHNOLOGY I YEAR TDC (2016-17)

Paper VI : *Metabolic Pathways*

Unit-I

Transportation across biomembrane, passive transport, active transport, facilitated transport, sodium, potassium and ATPase pump, role of calmodulin. Bioenergetics-general concepts of thermodynamics, energy, enthalpy, free energy, catalysis, activation energy. Metabolism- catabolism and anabolism. General concepts in metabolic pathways and their regulation.

15 Credit hours

Unit-II

Photosynthesis : significance, historical aspects, photosynthetic pigments, action spectra and enhancement effects, concept of two photosystems, Z-scheme, photophosphorylation, Calvin cycle, C_4 pathway, CAM plants, photorespiration. Transport of organic substances : mechanism of phloem transport, source-sink relationship, factors affecting translocation.

15 Credit hours

Unit-III

Respiration : ATP-the biological energy currency, aerobic and anaerobic respiration, Kreb's cycle, electron transport mechanism (chemi-osmotic theory), redox potentials, oxidative phosphorylation, pentose phosphate pathway, Gluconeogenesis.

15 Credit hours

Unit –IV

Nitrogen and lipid metabolism : biology of nitrogen fixation, importance of nitrate reductase and its regulation, ammonium assimilation, structure and function of lipids, fatty acid biosynthesis, β-oxidation saturated and unsaturated fatty acids, storage and mobilization of fatty acids.

15 Credit hours

Unit – V

Primary and secondary metabolism in plants. Structure, biosynthesis and functions of phenolics, lignins and lignans, alkaloids, terpenoids, flavonoids, suberins, coumarins and furanocoumarins, stilbins.

15 Credit hours

Recommended Books

1. Horton and Moran. Principles & Biochemistry. Prentice Hall.
2. Buchanan, G. and Jones. Biochemistry and Molecular Biology of Plant. American Society of Plant Physiology.
3. David, L., Nelson and Cox. Lehninger : Principles of Biochemistry. McMillon Worth Pub.
4. Stryer. Biochemistry. John Wiley & Sons.