MBT II: MICROBIAL PHYSIOLOGY AND BIOCHEMISTRY

TOTAL HOURS: 60 **CREDITS: 4**

UNIT-I: Biomolecules

No. of hours: 12

General characters and outline classification of Carbohydrates (Monosaccharides-Glucose, fructose, ribose, Disaccharides- Sucrose, Lactose, Polysaccharides- Starch, glycogen, Cellulose)

General characters and outline classification of Lipids and fatty acids (phospholipids, polybêta hydroxy alkanes)

General characteristics of amino acids and proteins. Amino acids in peptidoglycan

Structure of Nucleic acid

UNIT-II: Enzymes

No. of hours: 12

Properties and classification of Enzymes.

Biocatalysis - induced fit and lock and key models.

Coenzymes and Cofactors.

Inhibition of enzyme activity- competitive, noncompetitive, uncompetitive and allosteric.

Factors effecting enzyme activity

UNIT III: Analytical Techniques

No. of hours: 12

Principle and applications of -
Colorimetry
Chromatography (paper, thin-layer and column),
Spectrophotometry (UV & visible),
Centrifugation and
Gel Electrophoresis (Agarose and SDS).

16/1/21

UNIT IV: Microbial Nutrition and growth

No. of hours: 12

Nutritional requirements of Microorganisms
Methods of uptake of nutrients by cells
Nutritional groups of microorganisms- autotrophs, heterotrophs, lithotrophs, organotrophs, phototrophs, chemotrophs
Microbial Growth- different phases of growth in batch cultures; Synchronous, continuous, biphasic growth.
Factors influencing microbial growth
Methods for measuring microbial growth Direct microscopy, viable count estimates, turbidometry and biomass.

UNIT- V : Microbial metabolism

No. of hours: 12

Aerobic respiration - Glycolysis, TCA cycle, ED Pathway, Electron transport
Oxidative and substrate level phosphorylations.
Anaerobic respiration (Nitrate and sulphate respiration)
Fermentation- lactic acid and ethanol fermentations
Outlines of oxygenic and anoxygenic photosynthesis in bacteria

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