

## **MB3PGP1- LABORATORY COURSE I**

**Credit 4**

### **Biochemistry, Physiology & Cell Biology and Genetics:**

#### **Biochemistry:**

1. Preparation of solutions:

- Percentage solutions,
- Molar solutions,
- Normal solutions
- Dilution of Stock solutions

2. Preparation of buffers using the Henderson Hasselbach equation

3. Spectrophotometric experiments:

- Verification of Beer Lambert's law
- Determination of UV-Visible spectrum of compounds
- Determination of Concentration of molecules from Molar Extinction Coefficient values

4. Chromatographic techniques

- Separation of amino acids by Paper chromatography (Descending or Ascending)
- Separation of Plant pigments by Thin layer chromatography

5. Extraction of Polysaccharides (Starch, Glycogen), Proteins, from appropriate source:

- Quantification of isolated polysaccharide (anthrone method), protein (Lowry's method) and lipids

6. Estimations

- Quantitative estimation of reducing sugars by Dinitrosalicylic acid method
- Quantitative estimation of Methionine by Nitroprusside method
- Saponification value, iodine value, of fat sample
- Estimation of Cholesterol by Zak's method

7. Qualitative analysis of Carbohydrate mixtures (a combination of polysaccharide, disaccharide and monosaccharide) following systematic scheme for analysis.

(Starch, dextrin, glycogen, glucose, fructose, xylose, galactose, sucrose, maltose, lactose)

## **Physiology:**

1. Determination of haemoglobin concentration
2. Determination of haematocrit
3. Enumeration of blood cells: a) erythrocytes by haemocytometry, b) total leukocyte by haemocytometry
4. Preparation of Blood smears for differential count and cell morphology
5. Determination of Erythrocyte sedimentation rate
6. Determination of bleeding time
7. Determination of blood clotting time

## **Cell Biology and Genetics:**

1. Study of various stages of mitosis using cytological preparations of onion root tips.
2. Study of various stages of meiosis using cytological preparation of flower buds
3. Karyotype study using cytological preparation of dividing root tip cells of onion /photographs /permanent slides
4. Study in the ultra structure of cell organelles using electron microphotographs pics.
5. Solving genetic problems related to monohybrid, dihybrid ratio and interaction of genes

## **References**

1. Introductory Practical biochemistry, S. K. Sawhney & Randhir Singh (eds) Narosa Publishing House, New Delhi, ISBN 81-7319-302-9, p 195 - 303
2. Standard Methods of Biochemical Analysis, S. K. Thimmaiah (ed), Kalyani Publishers, Ludhiana ISBN 81-7663-067-5, p 12 - 18
3. Hawk's Physiological Chemistry, Bernard L. Oser (ed) TATA McGRAW Hill Publishing Company LTD, New Delhi, p 60 – 127, 1317- 1334
4. Experimental Biochemistry: A Student Companion, Beedu Sasidhar Rao & Vijay Deshpande (ed), I.K International Pvt. LTD, New Delhi ISBN 81-88237-41-8, p 13- 17, p 49 - 72
5. Practical Biochemistry, R.C. Gupta & S. Bhargava (eds) CBS Publishers and Distributors, New Delhi, ISBN 81-239-0124-0 p 9 – 27
6. Practical Clinical Chemistry, Harold Varley, CBS Publishers and Distributors, New Delhi,
7. Medical Laboratory Technology – A procedure manual for routine diagnostic tests Volume 1, K.L. Mukherjee, Tata McGraw-Hill Publishing company LTD, New Delhi

