

**SARDAR PATEL UNIVERSITY**  
**Programme: MSC (Applied Science)**  
**Semester: I**  
**Syllabus with effect from: June 2013**

<b>Paper Code:</b> PT01EASC02	<b>Total Credits: 4</b>
<b>Title Of Paper:</b> Quantitation of Biological Molecules and Introduction to Laboratory Medicine	

Unit	Description in detail	Weightage (%)
<b>1</b>	<b>Basics of Scientific Calculations &amp; Quantitation of DNA, RNA and Protein:</b> Scientific Notation, Metrix Prefixes, Significant digits, exponent and scientific notion, Metrix Prefixes Solution Mixture and Media, Molarity, Normality, Dilution, Acid base chemistry, Spectrophotometry calculation, Protein Calculation (protein Molecular Weight, Protein Quantification, Isoelectric point determination), Nucleic acid quantification (Determining Concentration of Double Stranded DNA, Determining Concentration of single Stranded DNA, oligonucleotide Quantification, Measuring RNA concentration and Molecular Weight, Molarity and Nucleic acid length)	<b>25 %</b>
<b>2</b>	<b>Calculation based on Radioactivity and other modern techniques:</b> Isotopes in Biochemistry, Determination of biological half life, Radioactive Decay, Labelling of Nucleic Acid with radioisotopes, Calculation required for Growth Kinetics, PCR, Real Time PCR, Recombinant DNA technology, Nanotechnology and Chromatography.	<b>25 %</b>
<b>3</b>	<b>Clinical Pathology, Haematology &amp; Clinical Biochemistry:</b> Physical, chemical, Microscopic Examination of Urine, Sputum, Faeces, Cerebrospinal fluid (CSF) and other body fluids, Normal constituents of Blood, their structure and function, Collection of Blood samples and various Anticoagulants, Hb, PCV, ESR, Normal Haemostasis, Bleeding Time, Clotting Time, Prothrombin Time, Activated Partial Thromboplastin Time. Blood grouping and Rh Types, Cross matching. Blood sugar regulation (Hormonal), Abnormalities, Diabetes mellitus, GTT, Glycated- Hemoglobin, Liver function tests, Renal function tests, Pancreatic function tests, Thyroid function tests, Cardiac function test.	<b>25 %</b>
<b>4</b>	<b>Clinical Microbiology &amp; Hospital Infection Control:</b> Classification of microorganisms, Size, shape and structure of bacteria, Use of microscope in the study of bacteria. Principles and use of equipments of sterilization namely Hot Air oven, Autoclave and serum inspissator, Antiseptic and disinfectants, Nutrition, growth and multiplications of bacteria, Culture and antimicrobial sensitivity test, Principles of common serological tests namely Widal, VDRL, HIV and HBsAg, Diseases caused Staphylococci, E. coli, Pseudomonas, Salmonella, Mycobacteria, E.histolytica, Plasmodium, Hepatitis viruses and HIV. Prevention and control of Health-care associated infections (HAIs): Types of HAIs, Routes of transmission. Measures for prevention and Control, Bio-medical Waste Management.(BMW)	<b>25 %</b>

**Basic Text & Reference Books:**

- Biochemical Calculation, Irwin H. Segel
- Calculation in Molecular Biology and Biotechnology, Frank H. Stephenson
- Biochemical Calculations, Biostatistics, E. Padmini
- A Guide to Lehninger Principles of Biochemistry

