

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

<b>Paper Code:</b> PT01CASC05	<b>Total Credits: 4</b>
<b>Title Of Paper:</b> Practicals in Physical, Chemical and Biological Sciences	

Unit	Description in detail	Weightage (%)
<b>1</b>	<p><b>Chemical Sciences:</b></p> <ul style="list-style-type: none"> <li>• To determine the percentage of two optically active substances in a given Solution polarimetrically.</li> <li>• Determination of dissociation constant, <math>K_a</math> for aspirin by pH metry.</li> <li>• To determine the rate constant of hydrolysis of methyl acetate catalyzed by an acid, and also the energy of activation.</li> <li>• Synthesis of o- and p-nitrophenol from phenol.</li> <li>• Separation of o- and p-nitrophenol by steam distillation method.</li> <li>• Pinacol-Pinacolone re-arrangement</li> <li>• Emulsion polymerization of methyl methacrylate using free radical initiator</li> <li>• Solvent-Free Cannizzaro Reaction involving grinding of liquid 2-chlorobenzaldehyde with potassium hydroxide</li> <li>• Preparation of Ni-DMG complex and determination of <math>Ni^{2+}</math> by gravimetric method.</li> <li>• Preparation of Nickel Ammonium sulphate and determine its %age purity by estimating Nickel volumetrically.</li> </ul>	<b>33.33 %</b>
<b>2</b>	<p><b>Physical Sciences:</b></p> <ul style="list-style-type: none"> <li>• Electron- diffraction: Analysis of electron diffraction pattern and determination of the Inter-planar distance of the crystal.</li> <li>• Phase Angle measurement by Cathode Ray Oscilloscope (CRO) and then to determine the unknown Capacitance/ Resistance/ Operating Frequency of the circuit.</li> <li>• Determination of the Energy Bandgap (<math>E_g</math>) of a Semiconductor by studying the reverse bias characteristics of diode at different temperatures.</li> <li>• Ultrasonic Interferometer.</li> <li>• Geiger Muller (G. M.) Counter: To study the GM Characteristic to determine the operating voltage of the counter and then to study the absorption of beta rays through metals.</li> <li>• Simulation of radio activity: To determine the half-life of a radioactive material.</li> <li>• Logic Gates: Basic Logic gates and its applications as parity checker, Grey to BCD code converter, Half adder etc.</li> <li>• Dissociation Energy of Iodine (<math>I_2</math>) Molecules: Estimation of the dissociation energy of <math>I_2</math> molecule by studying its vibrational spectra.</li> <li>• Laser beam Characteristics: To determine the basic parameters of a laser beam.</li> </ul>	<b>33.33 %</b>
<b>3</b>	<p><b>Biological Sciences:</b></p> <ul style="list-style-type: none"> <li>• Determination of <math>\lambda_{max}</math> of a given dye (Beer's and Lambert's law).</li> </ul>	



	<ul style="list-style-type: none"> <li>• Measurement of partition coefficient index.</li> <li>• Amino acid separation by Thin Layer Chromatography.</li> <li>• Protein estimation by Folin-Lowery Methodology.</li> <li>• Glucose estimation by DNS method.</li> <li>• Glucose estimation by GOD-POD (enzymatic method).</li> <li>• Mitochondrial staining.</li> <li>• Study of cell division (Mitosis).</li> <li>• DNA estimation by DPA method.</li> <li>• RNA estimation by orcinol method.</li> </ul>	<b>33.33 %</b>
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**Basic Text & Reference Books: -----**

