

**SARDAR PATEL UNIVERSITY**  
**Programme & Subject: M.Sc (Defence Science)**  
**Semester: I**  
**Syllabus with Effect from: June - 2014**

<b>Paper Code: PT01CDSC05</b>	<b>Total Credit: 4</b>
<b>Title Of Paper: Practical in Physical, Chemical &amp; Biological Sciences</b>	

Unit	Description in Detail	Weightage (%)
<b>Chemical Science</b>		
	To determine the percentage of two optically active substances in a given Solution polarimetrically.	
	Determination of dissociation constant, $K_a$ for aspirin by pH metry.	
	To determine the rate constant of hydrolysis of methyl acetate catalyzed by an acid, and also the energy of activation.	
	Synthesis of o- and p-nitrophenol from phenol.	
	Separation of o- and p-nitrophenol by steam distillation method.	
	Pinacol-Pinacolone re-arrangement	
	Emulsion polymerization of methyl methacrylate using free radical initiator	
	Solvent-Free Cannizzaro Reaction involving grinding of liquid 2-chlorobenzaldehyde with potassium hydroxide	
	Preparation of Ni-DMG complex and determination of $Ni^{2+}$ by gravimetric method.	
	Preparation of Nickel Ammonium sulphate and determine its %age purity by estimating Nickel volumetrically.	
<b>Physical Sciences</b>		
	Electron- diffraction: Analysis of electron diffraction pattern and determination of the Inter-planar distance of the crystal.	
	Phase Angle measurement by Cathode Ray Oscilloscope (CRO) and then to determine the unknown Capacitance/ Resistance/ Operating Frequency of the circuit.	
	Determination of the Energy Bandgap ( $E_g$ ) of a Semiconductor by studying the reverse bias characteristics of diode at different temperatures.	
	Ultrasonic Interferometer.	
	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.	
	Simulation of radio activity: To determine the half-life of a radioactive material.	
	Logic Gates: Basic Logic gates and its applications as parity checker, Grey to BCD code converter, Half adder etc.	
	Dissociation Energy of Iodine ( $I_2$ ) Molecules: Estimation of the dissociation energy of $I_2$ molecule by studying its vibrational spectra.	
	Laser beam Characteristics: To determine the basic parameters of a laser beam.	
<b>Biological Science</b>		
	Determination of $\lambda_{max}$ of a given dye (Beer's and Lambert's law).	
	Measurement of partition coefficient index. Amino acid separation by Thin Layer Chromatography.	



	Protein estimation by Folin-Lowery Methodology.	
	Glucose estimation by DNS method.	
	Glucose estimation by GOD-POD (enzymatic method).	
	Mitochondrial staining.	
	Study of cell division (Mitosis).	
	DNA estimation by DPA method.	
	RNA estimation by orcinol method	

