

**B.SC. PHYSICS****SEMESTER – V****CORE - V ELECTRICITY AND MAGNETISM****UNIT I**

Principle of a capacitor – energy stored in a capacitor – energy density – change in energy due to dielectric slab – force of attraction between plates of a charged capacitor – capacitance of a spherical and cylindrical capacitors – types of capacitors – quadrant electrometer – measurement of potential, ionization current and dielectric constant.

**UNIT II**

Carey-Foster Bridge – theory – temperature coefficient of resistance – potentiometer – calibration of ammeter and high range voltmeter – thermoelectricity – laws of thermo e.m.f., intermediate metals, intermediate temperature – measurement of thermo e.m.f. using potentiometer – Peltier effect and Peltier coefficient – Thomson effect and Thomson coefficient – relation between  $\pi$  and  $\sigma$  – thermo electric diagrams and its uses.

**UNIT III**

Magnetic induction due to a straight conductor carrying current – magnetic induction on the axis of a solenoid – moving coil ballistic galvanometer – damping correction – determination of absolute capacity of a condenser – self – inductance by Anderson's Bridge method – experimental determination of mutual inductance – coefficient of coupling.

**UNIT IV**

Transient current – growth and decay of current in a circuit containing resistance and inductance – growth and decay of charge in a circuit containing resistance and capacitance – measurement of high resistance by leakage – growth and decay of charge in a LCR circuit – condition for the discharge to be oscillatory – frequency of oscillation.

**UNIT V**

Alternating current – peak, average and RMS value of current and voltage – form factor – ac circuit containing resistance and inductance – choke coil – ac circuit containing resistance and capacitance – series and parallel resonance circuits – Q factor – power in an ac circuit containing LCR – Wattless current – Transformer – construction, theory and uses – energy loss – skin effect.

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**B.Sc. PHYSICS****BOOKS FOR STUDY:**

1. Brijlal and Subramaniam, Electricity and Magnetism, S. Chand & Co, New Delhi (2016)
2. R. Murugesan, Electricity and Magnetism, S. Chand & Co, New Delhi (2016)
3. Hugh D. Young and Roger A. Freedman, Sears & Zemansky's University Physics with Modern Physics, 14th Edition (2015)

**BOOKS FOR REFERENCE:**

1. D. N. Vasudeva, Electricity and Magnetism, S. Chand & Co, New Delhi (2016)
2. K. K. Tewari, Electricity and Magnetism, S. Chand & Co, New Delhi (2016)
3. Hugh D. Young and Roger A. Freedman, Sears & Zemansky's University Physics with Modern Physics, 14th Edition (2015)