

	To determine the frequency of a.c. emf by series resonance circuit varying capacitor.	
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Reference books

1. B. Sc. Practical Physics by C. L. Arora , 20th Edition , 2020 S. Chand and Company
2. Practical Physics by G. L. Squires. 4th edition , Cambridge , 2001.
3. Practical Physics with viva – voce Dr.S.L. Gupta and Dr.V.Kumar , 27th edition , 20210 Pragati Prakashan .

Semester: 1	Course No.: 113(T)	Course Code: : PHE 113(T) Course Title: Mathematical Physics and Basic analog Electronics
Credits: 2		Course Category: Minor paper

Course Outcomes: On successful completion of the course the learner will be able to

CO#	COGNITIVE ABILITIES	COURSE OUTCOMES
CO111 T-1	REMEMBERING	Overview of some basic theories related to the subject and study of fundamental concepts in physics
CO111 T-2	UNDERSTANDING	Understanding essential to study various different fields in Physics will be developed .
CO111 T-3	APPLYING	Ability to apply concepts of physics in science engineering and technology will be developed that will strengthen student's analytical abilities .
CO111 T-4	ANALYSING	
CO101.5	EVALUATING	

Unit No.	Unit Contents	Sessions Allotted
1	Introduction, Applications of Vector Multiplication, Triple Scalar Product, Triple Vector Product, Differentiation of Vectors, Fields, Directional Derivative, Gradient, Some other expressions involving ∇ , Green's Theorem in the plane, The Divergence and the Divergence theorem. Gauss's law, The curl and Stoke's theorem.	15
2	Diode: load line analysis of diode circuit Rectifier : Half wave rectifier circuit, Graphical analysis of half wave rectifier, Mathematical analysis of HW rectifier, Full wave rectifier circuits, Mathematical analysis of full wave rectifier circuit, Important aspects of rectifier circuits, comparison of half wave and full wave rectifier, Bridge rectifier Transistor: Transistor, Naming the transistor terminals, some facts about the transistor, transistor action, Transistor symbols, transistor as an amplifier, Transistor connections, CB connection, Characteristics of CB connection, CE connection, Measurement of leakage current, characteristics of CE connection, CC connection, comparison of transistor connections, commonly used transistor connection, Transistor as an amplifier in CE arrangement, Transistor load line analysis, operating point, Practical way of drawing CE circuit, output from transistor amplifier, Performance of transistor amplifier, cut off and	15

	saturation points, power rating of transistor, Determination of transistor configuration, semiconductor devices numbering system, transistor lead identification, Transistor testing	
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Suggested Text Books:

1. Mathematical methods in Physical Sciences By M.L. Boas, chapter 6, articles 1 to 7 and 9 to 11, 3rd edition, 2006, John Wiley & Sons.
2. Fundamentals of Electronics by Anokh Singh Chapter-5, articles-5.1 to 5.9 4th Edition 1986, Khanna Publishers
3. Principles of Electronics V. K. Mehta and Rohit Mehta, Chapter-8, 8.1 to 8.27 34th edition, 2017, S. Chand publication.
4. Electronics devices and circuits – An introduction Allen Mottershead Ch-2, article 2.1 PHI learning private Ltd., 2011.

Reference Books:

1. Mathematical Methods for Physicist, Arfken, Weber and Harris 7th Edition, 2012, Elsevier.
2. Basic Electronics and Linear Circuits, N.N, Bhargava, D.C. Kulshrestha and S.C. Gupta, 2nd Edition, 2017, NITTR, Chandigarh.

Semester: 1	Course No.: 113 (P)	Course Code: PHE 113(P) Course Title: : Physics lab
Credits: 2		Course Category: Minor paper

Course Outcomes: On successful completion of the course the learner will be able to

CO#	COGNITIVE ABILITIES	COURSE OUTCOMES
CO111 T-1	REMEMBERING	Get acquainted and learn the use of different laboratory instruments
CO111 T-2	UNDERSTANDING	Hands on training to measure passive components required for any electronic circuits and to impart knowledge to study fundamental principles in various electronic circuits.
CO111 T-3	APPLYING	To measure different physical quantities related to general physics, optics and passive components of electronic circuits
CO111 T-4	ANALYSING	
CO101.5	EVALUATING	

Unit No.	Unit Contents	Sessions Allotted
1	GROUP A 1. To find the prism angle and refractive index of a prism using spectrometer. 2. Melde's Experiment. (i) To prove P/L constant. (ii) To prove T/L ² constant 3. Resonator	30

	<p>To test the accuracy of relation $n^2 (V + Kv) = \text{constant}$ and to determine the frequency of unknown fork.</p> <p>4. Flywheel</p> <p>To determine the moment of inertia.</p> <p>5. Radioactive decay</p> <p>Simulation of Nuclear Radioactive decay using Calculator.</p> <p>6. Study of travelling microscope</p> <p>To find distance between two given points, to find diameter of a ring, to find inner and outer diameter of a rubber tube.</p>	
2	<p style="text-align: center;">GROUP: B</p> <p>1. Measurement of resistance, capacitor and inductance using LCR meter</p> <p>Study of diode using multimeter , Resistance value using colour code</p> <p>Testing of continuity of fuse</p> <p>2. Measurement of Boltzmann's constant using Diode</p> <p>3. Thevenin Theorem</p> <p>4. Norton theorem</p> <p>5. Maximum power transfer theorem</p> <p>6. Value of capacitance</p> <p>For given two capacitors determine the value of capacitance for each of them</p> <p>(i) by connecting them in series and (ii) by connecting them parallel.</p>	30

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