(20A56101P) Engineering PHYSICS LAB

- **PREPARED BY**

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COURSE OUTCOMES

- **CO1:** Estimate wavelength of laser and particles size using laser.
- **CO2:** Evaluate the acceptance angle of an optical fiber and numerical aperture.
- **CO3:** Estimate the susceptibility and related magnetic parameters of magnetic materials.
- **CO4:** Plot the intensity of the magnetic field of circular coil carrying current with distance.
- **CO5:** Determine magnetic susceptibility of the material and its losses by B-H curve. Apply the concepts of ultrasonics by acoustic grating.

Experiments List as per affiliated University

1. Determine the thickness of the wire using wedge shape method
2. Determination of the radius of curvature of the lens by Newton's ring method
3. Determination of wavelength by plane diffraction grating method
4. Determination of dispersive power of prism.
5. Determination of wavelength of LASER light using diffraction grating.
6. Determination of particle size using LASER.
7. To determine the numerical aperture of a given optical fiber and hence to find its acceptance angle
8. Determination of dielectric constant by charging and discharging method.
9. Magnetic field along the axis of a circular coil carrying current –Stewart Gee's method.
10. Measurement of magnetic susceptibility by Gouy's method
11. Study the variation of B versus H by magnetizing the magnetic material (B-H curve)
12. Determination of ultrasonic velocity in liquid (Acoustic grating)
13. Rigidity modulus of material of a wire-dynamic method (Torsional pendulum)
14. Sonometer: Verification of the three laws of stretched strings
15. Determination of spring constant of springs using Coupled Oscillator.

List of Additional Experiments

1. Determine the width of a slit by using single slit experiment.
2. Determination of the separation between two slits by using Double slit experiment.
3. Determine the Resolving Power of Grating.
4. Determination of dispersive power of Grating.

Introduction to Spectrometer

spectrometer, is a device for detecting and analysing wavelengths of electromagnetic radiation, commonly used for molecular. As used in traditional laboratory analysis, a spectrometer includes a radiation source and detection and analysis equipment. Emission spectrometers excite molecules of a sample to higher energy states and analyse the radiation emitted when they decay to the original energy state. Absorption spectrometers pass radiation of known wavelength through a sample, varying the wavelengths to produce a spectrum of results; the detector system reveals to what extent each wavelength is absorbed.

Fig.: Spectrometer

Travelling Microscope

A **travelling microscope** is an instrument for measuring length with a resolution typically in the order of 0.01mm. The precision is such that better-quality instruments have measuring scales made from Invar to avoid misreadings due to thermal effects. The instrument comprises a microscope mounted on two rails fixed to, or part of a very rigid bed. The position of the microscope can be varied coarsely by sliding along the rails, or finely by turning a screw. The eyepiece is fitted with fine cross-hairs to fix a precise position, which is then read off the vernier scale. The purpose of the microscope is to aim at reference marks with much higher accuracy than is possible using the naked eye. It is used in laboratories to measure the refractive index of flat specimens using the geometrical concepts of ray optics. It is also used to measure very short distances precisely, for example the diameter of a capillary tube. This mechanical instrument has now largely been superseded by electronic- and optically based measuring devices that are both very much more accurate and considerably cheaper to produce.

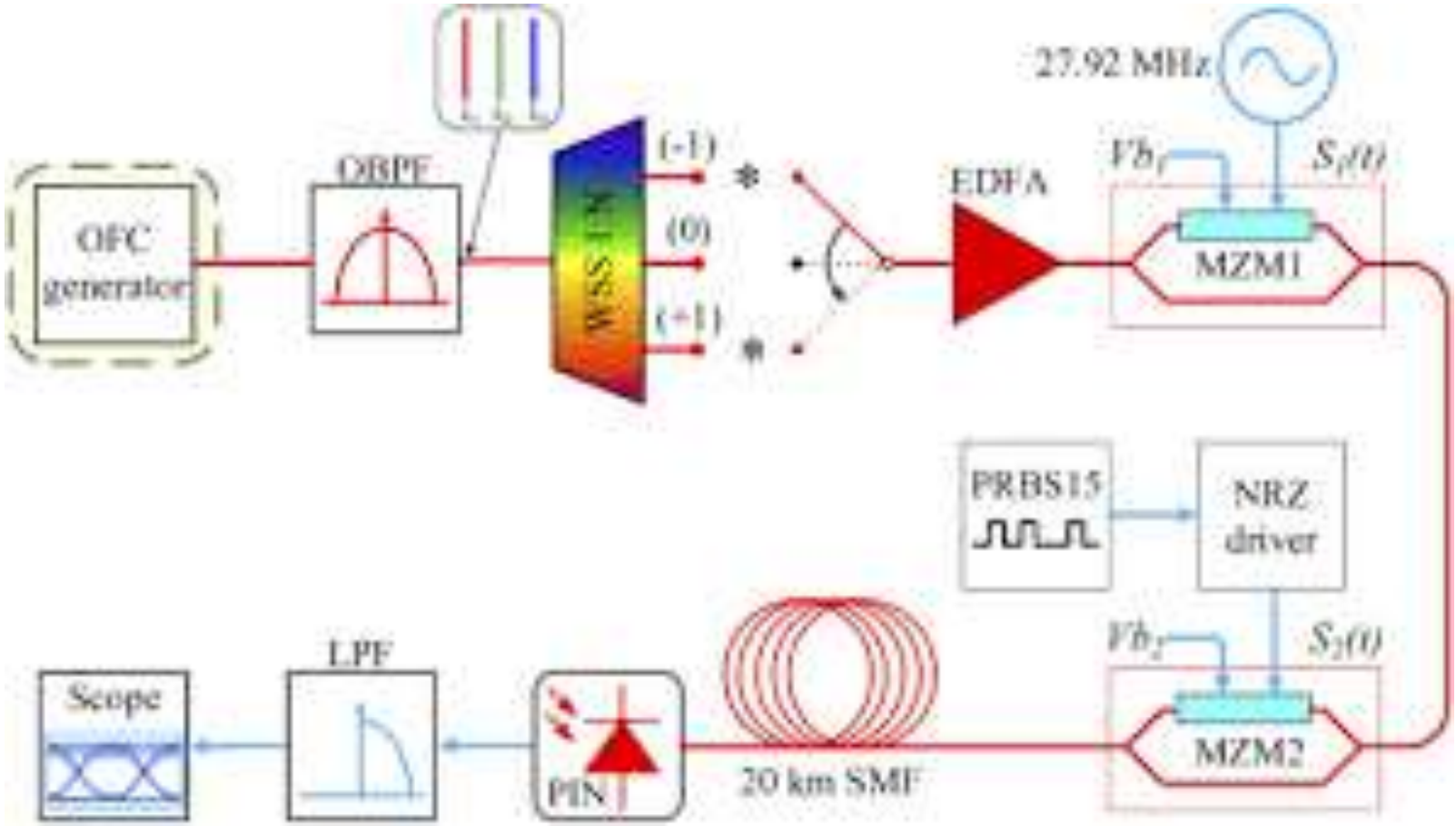
Fig: Travelling Microscope

Characteristics of Laser

Characteristics

1. Highly Monochromatic
2. Highly Directionally (or) Low divergence
3. Coherent
4. Highly Intensity (or) Brightness

Optical communication set up



Major Equipments List

ENGINEERING PHYSICS AND APPLIED PHYSICS LABORATORY
LIST OF MAJOR EQUIPMENTS

S.No.	NAME OF THE EQUIPMENT	NAME OF THE SUPPLIER	QUANTITY	QUANTITY PER UNIT	Amount Rs
1.	Wedge method setup	ELCO Scientific Instruments	2	8500	17,000
2.	Newton's rings equipment	ELCO Scientific Instruments	2	8500	17,000
3.	Dielectric constant kit	YCOO Y. P. Scientific Industry	2	8250	16,500
4.	Acoustic grating – velocity of ultrasonics	YCOO Y. P. Scientific Industry	2	59000	1,18,000
5.	Fiber optics kit	PICO Industries	4	4000	16,000
6.	Particle size using laser kit	PICO Industries	3	4500	13,500
7.	Laser wavelength using diffraction grating setup	PICO Industries	4	5500	22,000
8.	Coupled oscillator	YCOO Y. P. Scientific Industry	2	4000	8,000
				TOTAL	2,28,000/-

VEMU INSTITUTE OF TECHNOLOGY, P.KOTHAKOTA.
DEPARTMENT OF H & S

Do’s and Don’ts

1. While entering the Laboratory, the students should wear shoes and lab uniform. Female Students should tie their hair back.
2. The students should bring their observation note book, practical manual, record note book and calculator and necessary stationary items for the lab classes without which the students will not be allowed for doing the practical.
3. The student should not perform unauthorized experiments.
4. All the equipments should be handled with utmost care. Any damage will be charged.
5. At the end of practical class the apparatus should be arranged neatly.
6. Each experiment after completion should be written in the observation note book and should be corrected by the lab in charge on the same day of the practical class.
7. Each experiment should be written in the record note book only after getting signature from the lab in charge in the observation note book.
8. Record note book should be submitted in the following after completion of experiment.
9. 100% attendance should be maintained for the practical classes.

Safety Measures in the Laboratory

Fire Extinguishers

First Aid Box

Miniature Circuit Breaker's (MCB's).

CC Camera surveillance