General Physics lab Experiments

Electricity & Meg. lab Items

Modern Physics Lab Items (B.Sc & M.Sc.)

Basic Electric & Electrical Lab

Applied Mechanics Lab

Measurement lab Instruments

Other Equipments

General Physics Lab Experiments

MTECH P01 Young's Modulus Apparatus (Iron Frame)

Dr. Searle's design It is a famous instrument for determining the Young's modulus of a wire and is indispensable where most accurate measurements are desired. The instrument consists of two iron frames connected by a link. The Frames are fitted with self centering chucks .
An accurately graduated micrometer screw to read 0.01mm is fitted on a frame. One end of a sensitive spirit level is pivoted to one of the frame the other end on the points of a micrometer screw is fitted in other frame.

Setup Contains: - Young`s Modulus Unit fitted with spirit level, drum, Sample Wire, Slotted weight
500 gm, fixed weight, inch tape & Screw gauge.

MTECH P02 Bending of Beam Apparatus

OBJECT: - To study the depression of a beam and hence to determine Young's modulus of the material of beam using a spherometer.
Supplied complete with the following: -

1. Iron Beam
2. Two knife edge on rigid supports in a horizontal plane
3. Hanger with weight
4. Special Spherometer
5. Battery Eliminator.
6. Galvanometer.
7. Connecting wires
8. Inch Tape.
9. Instructions manual
10. Vernier calipers
11. Screw gauge
12. Rheostat.

MTECH P03 Bending of Beam Apparatus (Using Travelling Microscope)

OBJECT: - To study the depression of a beam and hence to determine Young's modulus of the material of beam using a travelling microscope
Supplied complete with the following: -

1. Iron Beam
2. Two knife edge on rigid supports in a horizontal plane
3. Hanger with weight
4. Center edge with pointer.
5. Inch Tape.

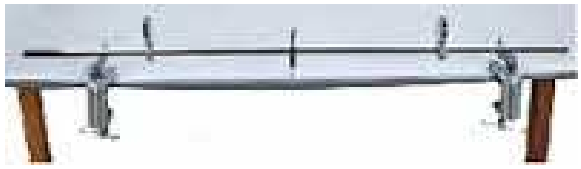
Vernier calipers.

6. Travelling Microscope.

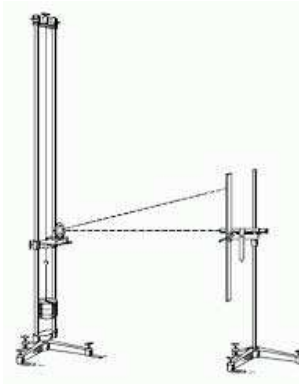
MTECH P04 Bending of Beam Apparatus (Using Koeing`s Method)

OBJECT:- To determine the young`s modulus Y by bending of a beam using Koeing`s method.
Supplied complete with the following: -

1. Rectangular Beam of bracc.
2. Two knife edge on rigid supports in a horizontal plane
3. Optical Lever type mirror.
4. Hanger with weight
5. Center edge with pointer.
6. Inch Tape.
7. Vernier calipers.
8. Reading Telescope.
9. Scale with stand.



MTECH P05 Optical Lever Method



OBJECT:- To determine the young`s modulus of wire by Optical Lever Method.
Supplied complete with the following: -

1. A Long accembly with optical lever mirror, sample wire.
2. Red Light Pointer.
3. Scale arrangement.
4. Slotted Weight
5. Screw Gauge.
6. Inch Tape.
7. Telescope.

MTECH P06 Rigidity Apparatus (Searle's Pattern)

One can find the modulus of rigidity and Young's modulus for the material of a wire by Searle's method.
The 30cm long wire under test is connected to two bracc rods about 30 cm long at their mid points by two screws fitted at the ends of the wire. The rods are suspended from hooks.
Setup Contains:- Rigidity modulus, sample wire, Digital Stop Watch, Vernier Caliper, Screw Gauge & Spring Balance.

MTECH P07 Moment of Inertia (Using Fly Wheel)

Comprising of carefully machined and balanced cast iron wheel of about 8`` dia and 4.4cm thick, and steel spindle supported on the ball bearings in strong iron brackets. The sides of the wheel are red or grey painted. The top of wheel is chrome plated and is marked with a thick red line. A pointer is fixed to one of the brackets. Diametric hole is drilled in the shaft to take a pin and cord. The base is provided with four holes so that the apparatus can be fixed on a wall, complete with cord and hook.
Setup Contains:- Fly Wheel Unit 8 Inch, Digital Stop Watch, Vernier Caliper, Slotted Weight 200 gm & Inch Tape.

MTECH P08 Compound Pendulum (Steel C.P.)

It consists of a powdered coated steel bar of dimensions 100×3.75×0.5cm with a number of equidistant holes drilled along its length at equal intervals of 5 cm. The pendulum is provided with two removable knife edges paccing through any one of the holes. Complete with wall bracket & two removable knife edges.
Setup Contains:-Compound Pendulum S.S with Knife edge, Digital Stop Watch, Vernier Caliper Inch tap.

MTECH P09 Kater's Reversible Pendulum (Steel C.P.)

It is a compound pendulum constructed on the principle that centre of oscillation and centre of suspension are interchangeable. It consists of a steel rod of 120cm long and 1.0 cm dia capable of two adjustable knife edges facing each other. Two metal weights (made of cast iron) of dimension 7.5 × 3.75cm (length × diameter) and (3.5 × 3.75cm) respectively can be made to slide along the length of the bar and can be clamped in any position. Two wooden weights exactly similar to metal weights can also slide along the bar. With the help of this apparatus we can find acceleration due to gravity at a place.
Setup Contains:- Kater Pendulum S.S with Knife edge, Digital Stop Watch, Vernier Caliper & Inch Tape.

MTECH P10 Torsion Apparatus Searle's Horizontal Pattern (Half Meter Long)

Two cast iron feets each with 3 through holes and grub securing screws, separating by two support rods approx 600mm long, one of which is graduated in cm and mm. The wheel 165mm dia. over groove moving on ball bearings is provided with chuck to hold the test rod of 55cm long and 5mm dia with two aluminum scales graduated 30-0-30 in single degrees, mounted on pillar support, which are adjustable along the rod, two pointers with clamp for attaching to specimen, on each of bracc and steel rods, cord and hook for carrying macces.
Setup Contains:-Torsion pendulum 1/2 Meter, Screw Gauge, Vernier caliper, Slotted weight 500 gm.

MTECH P11 Y by Uniform & Non-Uniform Bending

Consisting of two knife edges with heavy supporters, one meter scale with pin at the centre.
Setup Contains:- Pair of G Clamp, Meter wooden scale with center pointer, Slotted Weight & Travelling Microscope.

MTECH P12 Maxwell Needle Apparatus

Object:-To determine the modulus of rigidity of wire using Maxwell needle apparatus.
Setup contains following Accessories:-

1. A heavy duty Maxwell needle unit (S.S).
2. Wall Clamp with chuck.
3. Sample wire.
4. Screw Gauge.
5. Vernier Caliper.
6. Spring Balance.
7. Digital Stop Watch.
8. Inch Tape

MTECH P13 Torsion Apparatus Searle's (Vertical Pattern) or Barton's App

A steel frame mounted on a heavy cast iron base with leveling screws. Upper end of the rod (under test) 900mm length and 5mm dia is clamped by a 3-jaw chuck and the lower end is clamped into the axis of a torsional drum which can be rotated by putting load in the scale pan paccing over two frictionless pulleys. Freely sliding three circular scales graduated in single degrees can be clamped at any position. Three pointers for clamping to the test rod are provided. Complete with three other rods, strings and two scale pans, but without weights.

MTECH P14 Bifilar Pendulum

Object:-To study the oscillation in a bifilar suspension arrangement & verify its result observation.
Setup Contains:-

1. Bifilar Suspension arrangement.
2. Different Specimen of wires.
3. Inch Tape.
4. Digital Stop Clock.
5. Instruction Manual.

MTECH P15 Cavendish Pendulum

Object:-To determine the value of gravitational constant (G) by using Cavendish Pendulum.
Setup Contains:-

1. A Cavendish accembly with two large balls & two small balls.
2. Red Light Pointer.
3. Inch Tape.
4. Digital Stop Clock.
5. Scale with wall edges.

MTECH P16 Damped Oscillator using Simple Pendulum

Object:-To measure the logarithmic decrement, co-efficient of damping, relaxation time & quality factor of a damped simple pendulum.

Setup Contains:-

1. A Bracc pendulum bob with stand.
2. Scale with supporting edge.
3. Inch Tape.
4. Digital Stop Clock.
5. Sample Thread & Wires.

MTECH P17 Two Dimensional Oscillators

Object:- To study of conservation of momentum in two dimensional oscillations.

Setup Contains:-

1. An Arrangement of two iron bobs which fitted on acrylic body with scale & magnet.
2. Supply for Operating Magnet.
3. Digital Stop Watch.
4. Vernier Calipers.
5. Instructions Manual.

MTECH P18 Potential Energy Curve Apparatus

Object:-To Study the potential energy curves of a 1-Double system & oscillations in it for various amplitudes.

Setup Contains:-

1. Two Identical Rubber Bands.
2. Iron Stand with fitted scale.
3. Pointer.
4. Pan.
5. Different types of weight.
6. Digital Stop Watch.
7. Instruction Manual.

MTECH P19 Combinations of Springs

Object:-To study of oscillations of macc under different combinations of springs....

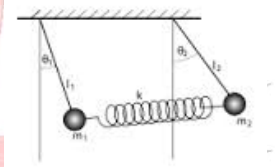
Setup Contains:-

1. Two identical springs Bands.
2. A Heavy Duty Iron Stand..
3. Pointer.
4. Pan.
5. Different types of weight.
6. Digital Stop Watch.

MTECH P20 Montecarlo Galton Board

Purpose: To determine the radius of the marble/ spherical objects through statistics.
(This equipment also may listed under mathematic laboratory aid.)
The Galton board is an upright board with evenly spaced nails driven in to its upper half. The nails are arranged in staggered order. The lower half of the board
Version 1: is divided with Vertical slats in to a number of narrow rectangular slots.
Version 2: Horizontal board marked with coordinates.
Accessories:
Marbles/ spherical balls (of same size): 100 numbers

MTECH P21 Coupled Pendulum

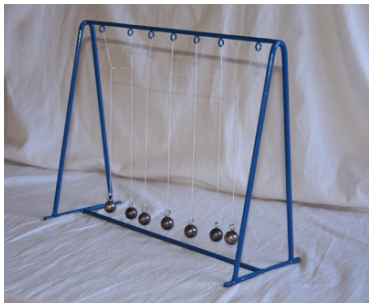


Setup Contains:-
Coupled pendulum – measurements of amplitudes, frequency, observation of synchronization.
An unit consist of two table top stand with peviot chuck in which two sample wire hanging with two same macc pendulum bob, Sample spring slinky type which connect between the two bobs.
It also contains:- Different bobs set, different spring set, Meter Scale, Stop Watch.

MTECH P22 Wave Motion using Maccive Rods

The inertia of the maccive rods makes for slow and majestic displays of torsional waves that appear as transverse waves when viewing the colorful ends of the rods. Wave fundamentals are easily introduced including: frequency, wavelength, amplitude, reflection, and phase. The device will also operate in a vertical format. Size: 30 cm wide x 90 cm long.

MTECH P23 Wave Motion using pendulum



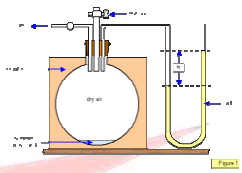
A set of seven pendulam of equal length fixed to a metal frame interconnected by a string at the top displays a captivating wave-like parade. This demonstrates how a wave motion is caused in the medium, phase relationship between the particles of the medium also useful for demonstrating transverse waves and longitudinal waves.

Thermal & Heat Lab Items

MTECH P24 Lee's Disc Apparatus

For determining the relative conductivity of thin layers of materials, it consists Of cylindricalbracc slab of 11cm dia and 10.5mm thickness. On this is connected Another 4.5cm deep bracc hollow cylinder (steam chest) of the same dia with inlet and outlet tubes for steam. A hole for thermometer is drilled radially in each, and the cylindrical bracc slab is fitted with eyelets to enable it to be suspended by three strings from a stout annular ring. The ring is held on a heavy Retortstand complete as above with accessories but without thermometer.
Setup Contains:- Lee & Disc Unit, Sample Disc Plates, Rubber Pipe, SteamBoiler, Thermometer 110 `c -02 Nos., Vernier Caliper & Digital Stop Watch.

MTECH P25 Determination of Adiabatic Constant (γ)



Setup Contains:- Clement & Desorme Unit with manometer, Hand Operated Pump, Rubber Pipe, Digital Stop Watch & Sample Chemical.

MTECH P26 Stefan's Boltzman Law Apparatus

Comprising a blackened hollow hemisphere about 25cm dia, fitted in a wooden board lines with tin, and a steam chamber above the hemisphere to measure them an uniform temperature by paccing steam through it recorded by two thermometers- Heavy silver disc soldered a bottom to copper - Constantan thermocouple housed in Ebonite tube with lid Engraved on ebonite tube are Disc Constants, macc and Area Complete with one extra similar thermocouple for calibration is supplied.
Setup Contains:- Stefan Law Unit with Camber & nozzle, Sample thermocouple, Steam Boiler, Thermometer, Digital Stop watch, Rubber Pipe, DCC Wire, Spot Galvanometer.

MTECH P27 Jaeger's Surface Tension Apparatus

This method is suitable for the purpose of studying the variation of surface tension, with concentration of solution of common salt in water.
Complete with manometer tube fitted on the stand, conical flask with side tube, dropping funnel, three different bore jets and beaker etc.
Setup Contains:- Jaeger Unit, Glacc Bottle with nozzle, Reservoir, Rubber Pipe, Beaker, Digital Stop Watch, Dropper Glacc Tube.

MTECH P28 Searle's Apparatus for Thermal Conductivity of copper

Comprising of a copper bar 25mm in diameter and 300mm in length fitted with a steam jacket heater at one end to be supplied from a steam boiler, and a copper water cool spiral at the other end. The bar has tubes for inlet of water and for thermometers. Fitted in a superior
quality wooden case.
Setup Contains:-Searle`s Apparatus, Steam Boiler, Beaker, Rubber Pipe, Thermometer, Digital Stop Watch.

MTECH P29 Poiseuille's Viscosity Apparatus

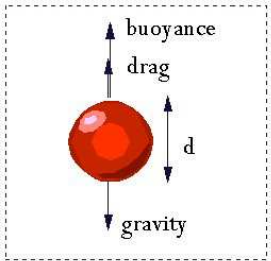
A capillary tube of fine bore is fitted on a wooden board. Then two ends are joined by a rubber tubing which is joined to two upright L-shaped glacc tubes forming the manometer with scale. With the help of a pinch cork, a steady flow of water is maintained. Complete with a three limbed constant level tank of bracc, one stand with rubber tube and glacc parts of corning glacc.
Setup Contains:- Poiseuille Unit, Reservoir, Rubber Pipe, Capillary tube, Travelling Microscope.

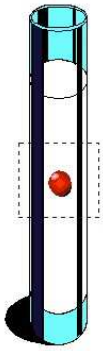
MTECH P30 Stroke`s Law Apparatus

Object:-To determine the coefficient of a liquid by stroke`s method.
Setup Contains:-

1. Viscosity Arrangement with Long Glacc tube.
2. Different colours of Rubber Bands.
3. Different radii steel & iron Ball.
4. Screw Gauge.
5. Inch Tape.
6. Glacc Plate.
7. Digital Stop Watch.
8. Instruction Manual.

Optional Acc:- Experimental Oil.





MTECH P31 Possion Ratio of Rubber Apparatus

An unit consist of long rubber tube with pointer which is fitted on heavy iron base, also fitted scale parallel to pointer for measure deflection.
Setup Contains:- A Possion Ratio Rubber Apparatus, Glacc Rod, Slotted Weight 500 gm, Inch Tape.

MTECH P32 Mechanical Energy into heat

Object:-To study of conversion of mechanical energy into heat..
Setup Contains:-

1. Callender & Brane`s Apparatus.
2. Constant Water Flow Tank.
3. Transformer for callender & brane`s.
4. AC Voltmeter & ammeter .
5. Two mercury thermometer.
6. Digital Stop Watch.
7. Rheostat.
8. Rubber pipe & crock.
9. Measuring Cylinder.
10. Instruction Manual.

MTECH P33 Linear Expansion Apparatus

Object:-To determine the cofficient of Linear expansion of a given metal rod by Linear Expansion Apparatus.
Supplied Complete with the following;

1. Linear Expansion Apparatus.(Horizontal / Vertical).
2. Copper Body Steam Boiler with rubber cock.
3. Rubber Pipe.
4. Galvanometer.
5. Variable Supply.
6. Patch Cords.
7. Instruction Manual.

Optional Required Acc:- Electric Heater.

MTECH P34 Thermal Conductivity

Object:-To find the cofficient of thermal conductivity of a copper strip using Searle`s Method.

Supplied Complete with following;

1. Searle`s Thermal Cond..apparatus.
2. Two thermometer.
3. Two thermometer 110 x 1/10.
4. Steam boiler with cock.
5. Rubber Pipe.
6. Stop Watch.
7. Constant Flow of Water.
8. Beaker.
9. Instruction Manual.

MTECH P35 Resonance Apparatus

Object:-To find the velocity of sound in air by using resonance apparatus at room temperature.

Supplied Complete with following.

1. Heavy Iron base with whole bracc pipe, rubber pipe.
2. Rubber pad.
3. Tuning forks Set.
4. Plumb Line.

Electricity & Meg. lab Items

MTECH P36 Stewart & Gee's Apparatus

It consists of a circular frame made from non- magnetic silver aluminum alloy. An insulating copper wire is wound on the frame. The ends of the wires are connected to the terminals which are fitted on the superior quality wooden board. A rectangular frame is supported on wooden board. The anodized aluminum rods are graduated up to 50 cm on both sides.
Superior quality permanent magnet compacc box moves on a platform. This platform moves on the rectangular frame along the axis of the coil supplied with a superior quality compacc box.
Setup Contains:- Stewart & Gee Unit, Reversing Key, DCC Wire, Spirit Level, Compass, Battery Eliminator, Rheostat & Ammeter.

MTECH P37 Tangent Galvanometer Apparatus for ECE of Copper

Setup Contains:-

1. Tangent Galvanometer with different turns.
2. Rheostat.
3. Reversing Key.
4. Spirit Level.
5. Copper Voltammeter..
6. Battery Eliminator.
7. Instruction Manual.

Optional Acc:- Digital Balance.

MTECH P38 Sonometer Apparatus

Object:- To determine the a.c mains frequency using Sonometer apparatus.
Setup contains following Accessories:-

1. A Wooden Sonometer unit with pair of rider.
2. Electromagnet with iron stand.
3. Power supply for electromagnet.
4. Slotted Weight 500 gm.

MTECH P39 Electrical Vibrator

For frequency ac mains.....
Supplied complete with the following:

1. Electrical Vibrator.
2. Thread, Pan & Different kind of Weight.
3. 100 Watt Bulb.

MTECH P40 Melde`s Apparatus

Object:- To study the transverse & longitudinal nodes parameters using Melde`s Apparatus.

Setup Contains following Accessories:-

1. A Heavy duty u shape Melde`s Unit with heavy iron base & electromagnet.
2. Pulley with stand.
3. Pan & thread.
4. Inch Tape.
5. Power Supply for electromagnet.
6. Fractional Weight.

MTECH P41 Calibration Setup of Potentiometer

Object:- To Calibrate the Voltmeter & Ammeter using Potentiometer.

Setup Contains following Accessories:-

1. A 10 Wire Potentiometer.
2. Low Voltage & low current power supply.
3. Rheostat.
4. Analog Voltmeter, Ammeter & Galvanometer.
5. DCC Wire.
6. Two Way Key.
7. STD Cell (Electronics Type).
8. STD Low Resistance.

MTECH P42 Resistance Thermometry

Object:- To determine the temperature coefficient of resistance for platinum , using a platinum resistance thermometer & Callender & Griffith`s Bridge.

Setup Contains:-

1. Callender & Griffiths Apparatus.
2. Power Supply,
3. Platinum Thermometer.
4. Boiler with heating Arrangement.
5. Temperature Sensor.
6. DCC Wire.
7. Galvanometer 30-0-30.
8. Rheostat.
9. Instruction Manual.

MTECH P43 Reduction Factor

Object:-To Determination of Reduction Factor of a different turns tangent Galvanometer for using a copper Voltammeter.

Setup Contains:-

1. Tangent Galvanometer with different turns..
2. Rheostat.
3. Reversing Key.
4. Spirit Level.
5. Copper Voltameter.
6. Battery Eliminator.
7. Instruction Manual.

Optional Acc:- Digital Balance.

MTECH P44 Earth`s Magnetic Field

Object:- To determine the value of horizontal components of Earth`s Magnetic Field.

Setup Contains:-

1. Tangent Galvanometer with different turns.
2. Rheostat.
3. Reversing Key.
4. Spirit Level.
5. Ammeter.
6. Battery Eliminator.
7. Instruction Manual.

MTECH P45 Thermo-e.m.f Thermometry

Object:- To study the variation of the thermo electric e.m.f with temperature for thermocouple.

Setup Contains:-

1. Thermocouple Arrangement of Cu- Fe.
2. 10- Wire Potentiometer.
3. Power Supply.
4. Galvanometer 30-0-30.
5. DCC Wire.
6. Resistance Box.
7. STD Cell.

MTECH P46 Carey - Foster Bridge

OBJECT:- To determine the resistance per unit length of the wire of Carey Foster's bridge and hence to calculate the value of low resistance with its help.

Supplied complete with the following: -

1. Carey Foster's bridge with variable selectable resistance
2. Battery Eliminator.
3. Connecting wire
4. Given wire of unknown resistance
5. Galvanometer 30-0-30
6. Resistance Box(0.1-10) Ohm
7. Instruction manual.

MTECH P47 Vibration Magnetometer

Object:-To determine the magnetic moment, M of a magnet & horizontal component of earth`s magnetic field, H at a place using Vibration Magnetometer.

Setup Contains:-

1. Vibration Magnetometer Unit.
2. Magnet as sample.
3. Digital Stop Watch.
4. A Rectangular Bracc Rod.
5. Instruction Manual

MTECH P48 H-Spectrum & Rydberg Constant

Setup Contains:- A Spectrometer with 7 Inch Dia , LC-30 Sec, A high tension voltage supply for hydrogen discharge tube, Hydrogen discharge tube, Diffraction grating 15000 Lines, Meg. Lens with LED, Spirit level.

Modern Physics lab Items (B.Sc & M.Sc)

MTECH P49 Newtons Rings

OBJECT: - To determine of wavelength of the given monochromatic light source with the help of Newton's circular fringes.

Supplied complete with the following:

1. Newton's ring microscope
2. Instruction manual
3. Philips Sodium vapour lamp 35 Watt.
4. Transformer for sodium vapour lamp 35 Watt.
5. Wooden box for sodium vapour lamp
6. Reading lens with torch.
7. Spherometer.

MTECH P50 Young`s Modulus by Carnu`s Method

Object:- To determine the parabolic & hyperbolic rings using Young's Modulus by Cornu's method.

Setup contains with following Accessories.

1. Young`s Modulus by Carnu`s Method.:- A Glacc accembly fitted on heavy iron base which is attached through metal rod through spring., fitted telescope with graticule.
2. Monochromatic Light Source:- With Lamp 35 W, Transformer 35 W & Wooden Case for Light.
3. Slotted Weight:- Heavy duty S.S make, 50gmx5.
4. Instruction Manual.

MTECH P51 Fresnel`s Bi-prism

OBJECT: - To find the wavelength of sodium light (monochromatic source) with the help of Fresnel's Bi-Prism.

Supplied complete with the following:

1. Fresnel Bi-Prism
2. Bi- Prism Accembly
   a) Bi-Prism Holder
   b) Auto Action / Lens Holder
   c) Micrometer Eyepiece
   d) Optical Slit
   e) Condensing Lens
1. Instruction Manual
2. Heavy Duty Optical Bench (1.5 Meter Long, Dual Rod)
3. Philips Sodium Vapour Lamp 35 Watt.
4. Transformer for Sodium Vapour Lamp 35 Watt.
5. Wooden Box for Sodium Vapour Lamp

MTECH P52 Diffraction grating apparatus

OBJECT: - To determine the wavelength of main spectral lines of mercury lamp with the help of diffraction grating.

Supplied complete with the following:

1. Grating 15000 Lines.
2. Philips Mercury Vapour lamp 80 Watt.
3. Choke 80 Watt.
4. Wooden box for (Mercury lamp)
5. Spectrometer 6 Inch.
6. Reading lens with torch
7. Sprit level.

MTECH P53 Optical Rotation (Half Shade Polarimeter)

OBJECT: -To determine the specific rotation of sugar solution with help of polarimeter.

Supplied complete with the following:

1. Half Shade Polarimeter
2. Measuring cylinder
3. Beaker with sugar cube.
4. Instruction manual
5. Reading lens with torch
6. Philips Sodium vapour lamp 35 Watt.
7. Transformer for sodium vapour lamp 35 Watt.
8. Wooden box for (Sodium vapour lamp)

MTECH P54 Interference by using Llyod Mirror

Setup contains following Accessories:-

1. Optical Bench 1.5 Mtr.
2. Optical Rider with stand.
3. Lyyod Mirror Accembly.
4. Sample Mirror + Lens.

MTECH P55 ì, ù of Prism by Spectrometer

OBJECT:- To determine the refractive index (ì) and dispersive power (ù) of the material of prism with the help of spectrometer.

Supplied complete with the following:

1. Spectrometer & Prism
2. Instruction manual
3. Philips Mercury lamp 80 Watt.
4. Wooden box for mercury lamp
5. Sprit level
6. Reading lens with torch

MTECH P56 Nodal Slide Apparatus

OBJECT:- To determine with the help of a Nodal Slide, the focal length of a combination of two lenses separated from each other by some particular distance. Supplied complete with the following:

1. Two Convex lenses
2. Nodal Slide Accembly
   a) Nodal Upright
   b) Mirror
   c) Optical Slit
   d) Lamp House
1. Instruction manual
2. Heavy Duty Optical Bench (1.5 Meter Long, Dual Rod)

MTECH P57 Resolving Power of Telescope

OBJECT:- To determine the resolving power of a telescope

Supplied complete with the following:

1. Telescope with variable rectangular slit
2. Instruction manual
3. Light Source with Different Slit.
4. Measuring Tape
5. Travelling Microscope

MTECH P58 Diffraction at Straight Edge

OBJECT:- To determine the wavelength of monochromatic light by diffraction at a straight edge. Supplied complete with the following:

1. An optical bench.
2. A sharp razor blade (i.e. straight edge)
3. Micrometer eyepiece
4. Slit
5. Instruction manual
6. Sodium vapour lamp 35 Watt.
7. Transformer for sodium vapour 35 Watt.
8. Wooden box for sodium vapour lamp
9. Reading lens with torch
10. Sprit level.

MTECH P59 Dispersive Power of Prism

OBJECT:- To determine the refractive index (ì) and dispersive power (ù) of the material of prism with the help of spectrometer.

Supplied complete with the following:

1. Spectrometer & Prism
2. Instruction manual
3. Philips Mercury lamp 80 Watt.
4. Wooden box for mercury lamp
5. Sprit level
6. Reading lens with torch

MTECH P60 Absorption Spectrum of Iodine Vapour

Object:- To determine the iodine absorption by using Spectrometer.

Supplied complete with the following:

1. Spectrometer.
2. Light Source.
3. Glacc tube with heating element.
4. Supply for Heating purpose.
5. Iron stand.
6. Grating 15000 Lines.
7. Iodine.

MTECH P61 Fabry Parot Etalon Fringes

OBJECT: - To study the Fabry-Parot etalon fringes and to determine the wavelength of a given monochromatic source (sodium lamp) of light.

Supplied complete with the following:

1. Fabry-Parot Etalon
2. Instruction manual
3. Spectrometer
4. Sodium vapour lamp 35 Watt.
5. Transformer for sodium vapour lamp 35 Watt.
6. Wooden box for sodium vapour lamp
7. Reading lens with torch
8. Sprit level

MTECH P62 Michelson Interferometer

Object:-To determine the wavelength of Monochromatic light with help of Michelson Interferometer.

Supplied complete with the following:

1. Heavy Duty Michelson Interferometer.
2. Philips Sodium vapour lamp 35 Watt.
3. Transformer for sodium vapour lamp 35 Watt.
4. Wooden box for sodium vapour lamp
5. Instruction Manual.

MTECH P63 Ultrasonic Velocity Apparatus

Object:-To determine the velocity of Crystal by using Spectrometer.

Supplied complete with the following:

1. Spectrometer 7 Inch.
2. Philips Sodium Light 35 Watt.
3. Sodium Lamp transformer 35 Watt.
4. Wooden Box for Lamp.
5. Quartz Crystal.
6. R.F crystal oscillator 3-8 MHz.
7. Sample Oil.

MTECH P64 Sextant Apparatus

Object:- To determine the height of window using Sextant Apparatus.

Supplied complete with the following:

1. Sextant Unit in bracc body.
2. Heavy Tripod Stand.
3. Inch Tape. (Long Length)
4. White board choke box.

MTECH P65 Characteristics of Ballastic Galvanometer

Object:-To study of Characteristics of Ballistic Galvanometer.

Setup Contains:-

1. Ballistic Galvanometer.
2. Lamp & Scale Arrangement.
3. Tapping Key.
4. DCC Wire.
5. Variable Supply (2-12) Volt.
6. Fixed capacitance Box.
7. Spirit Level.
8. Instruction Manual.

MTECH P66 Ballastic Galvanometer

Object:- To determine resistance value by high resistance Leakage Method.

Supplied complete with the following:

1. Ballastic Galvanometer.
2. Lamp & Scale Arrangement.
3. Supply for Setup.
4. Morse Key.
5. Two Way Key.
6. Capacitor.
7. High Resistance.
8. Instruction Manual.

MTECH P67 He- Ne Laser Setups

Determination of Wavelength, Divergence of Laser using Grating & Thickness of Wire.

Setup Contains:-

1. He-Ne Laser:- A Laser Tube along with Power Supply are Housed in thick powered coated aluminum box , From Hole the laser beam comes out. It has also wavelength 6328 A`, Red Color, Random Polarisation, 2mW.
2. Optical Bench:- 1.5 Meter Optical Bench with S.S , Full Shaper.
   a) Grating with 15000 Lines.
   b) Screen:- A Bakelite Board with Iron Rod.
   c) Other Acc:- Grating Holder, Inch Tape, Graph Paper & Different Dia Wire, Screw Guage.

MTECH P68 Earth Inductor

Object:-To find the angle of dip in the laboratory using an Earth Inductor..

Setup Contains:-

1. Ballastic Galvanometer.
2. Lamp & Scale Arrangement.
3. Earth Inductor. (1000 Turns).
4. Tapping Key.
5. Spirit Level.
6. DCC Wires.
7. Magnetic Compacc (Small).
8. Instruction Manual.

Experiment Performs:-

1. Voice transmission through optical fiber cable.
2. To study transmitter circuit & calculate its output power
3. To study receiver circuit & calculate its input power
4. To study the attenuation of signal between transmitter & receiver end.
5. Measurement of numerical aperture

In built IC based fixed dc regulated power supply + 6VDc. Pre amplifier stage consists of MIC (Microphone), photo detectors, transistors,& biasing network of resistance & capacitors. Power amplifier stages consists of impedance matching transformers, transistors & biasing network of resistance & capacitors. Output section having LED & speaker, fiber optic cable for transmission of signal. Circuit diagram is printed on glacc epoxy PCB & different combination of resistance & test point are brought out on front panel.

ries Required:-

Generator 1 MHz.

ultimeter.

MTECH P69 Mercury Light Source Unit

Light Source accembly is combination of two parts..

1. Mercury Lamp.
2. Wooden Box.

About parts..

a. **Mercury Lamp:-**

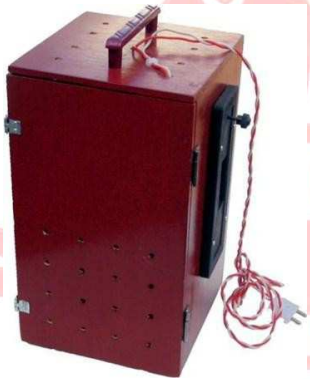
This High pressure mercury lamps.

Supplied Make:-Philips, Power:- 80 Watt, Operating Through:- Choke 80 W.

b. **Wooden Box:-**

This box is rectangular in shape and provided with slits on three sides equally spaced to enable three experiments to be performed simultaneously using one light source. Each Slit is provided with cover so that it can be closed when not required.

Bulb holders of finest quality are fitted in wooden box with special cord through the choke 80 Watt. Which fitted inside the box.



MTECH P70 Sodium Lamp Light Source Unit

Light Source accembly is combination of three parts.

1. Sodium Lamp.
2. Wooden box.
3. Operating Transformer.

About parts..

a. **Sodium Lamp:-**

This low pressure sodium vapour lamps works better than 99% of the visible output, concentrated in 5889 & 5895 Armstrong Spectral Lines.

Supplied Make:-Philips, Power:- 35 Watt, Operating Voltage:- 415 to 440 V.

b. **Wooden Box:-**

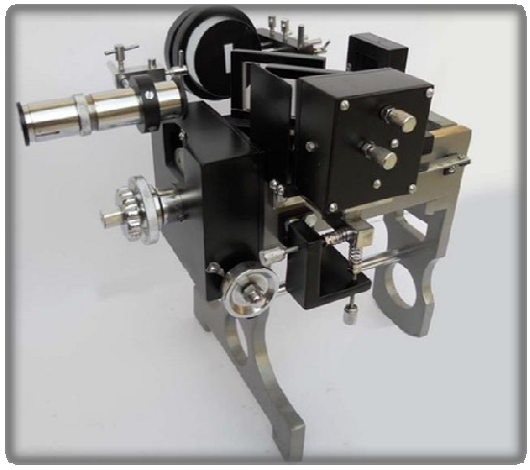
This box is rectangular in shape and provided with slits on three sides equally spaced to enable three experiments to be performed simultaneously using one light source. Each Slit is provided with cover so that it can be closed when not required. Bulb holders of finest quality are fitted in wooden box with special cord.

c. Operating Transformer:-

High grade lamination are used to avoid losses. The box is made from a thick metallic sheet. A piano type switch is provided for ON/OFF operation & flying lead is provided for main connection & output is via a special 3 pin socket is provided to avoid shock due to the leakage of the current .
This transformer is an Auto leak type, giving a starting voltage 440V which automatically reduces when the lamp has struck.

Power Output:- 35 Watt, Input Voltage:- 220 V, Output Voltage:- 440V.

MTECH P71 Michelson Interferometer



It is generally seen while working on this instrument that it is difficult, time consuming & tricky to locate the interference fringes. Taking into consideration this fact, MTECH has highly improved the existing version in their new design exclusively for trouble free performance. Instead of jumbling with 6 adjustment screws in the conventional design, MTECH are provided with only 2 adjustment screws at the back of the mirror M2. Mirror M1, beam splitter G1 & compensator G2 are factory adjusted and never to be tampered.

Technical Specifications:-

1. Supported on a stable metal stand.
2. High quality front coated silver mirrors of λ/10 accuracy are employed. Mirror M1 & M2 (32mmx32mmx7mm). G1 & G2 (50mmx38mmx7mm)
3. All adjustments to locate the fringes are done by two knurled screws provided at the back of mirror M2. Top screw moves the mirror is the vertical plain and the side screw in the horizontal plain. Two more spring loaded screws under M2 are also provided for fine adjustments of fringes while removing parallax.
4. Distance moved by mirror M1 is read on circular scale inside the front box (least count .01mm) and on micrometer scale on the right side of the box (least count.0001mm). A linear mm scale is also provided on the right side of the mirror M1 to position it properly.

MTECH P72 Hilger & Watts Type Heavy Duty Michelson Interferometer

This model specification is divided into two parts.

1. Mechanics
2. Optical

Mechanical part consists of following items.. Bed:- Bed is optically ground , Length 250mm.
Lead Screw:- Lead Screw is optically ground with its nut, length 200mm Pitch 1mm. Optical Mirror Mount:-kinematic mirror mounts are hold the mirror which be aligned in to orthogonal direction by means of screws provided at the rare of the mount.

Optical parts consists of following items.

Beam Splitter & Compensating Plate are covered from the same optically worked glacc plate.
Size:- 45mmX32mmX8mm &50mmX35mmX8mm.
Surface Flatness:-λ/10 (both faces). Parallelism:- 5 arc sec.
Mirrors:- 02 Nos.
Focal Length:- 25 mm
Thickness:- 10mm.
Front Surface Coated:-Coating material Al & SiO2. Mirror Reflection:- 90 %.
Attached Telescope Magnification:- 10 X Least Count of Instruments:- 10-4 mm.

MTECH P73 Dielectric Constant Apparatus

Object:- To calculate dielectric constant of liquids and solids.
The instrument consists of high frequency oscillator of tunable with outer gang condenser optimum tuning is indicated on meter. The change after placing dielectric between parallel plates is again detected and difference noted for calculation. Setup contains following Accessories are.
Dielectric kit with inbuilt RF Oscillator & analog meter.

1. Parallel Metal frame with two Bakelite plates for solid test.
2. Gang Capacitor 15-1500 pf for liquid test.
3. Patch Cords for connection.
4. Instruction Manual.

MTECH P74 Diffraction at straight edge

OBJECT: - To determine the wavelength of monochromatic light by diffraction at a straight edge.
Supplied complete with the following:

1. An optical bench.
2. A sharp razor blade (i.e. straight edge)
3. Micrometer eyepiece
4. Slit
5. Instruction manual
6. Sodium vapour lamp 35 Watt.
7. Transformer for sodium vapour 35 Watt.
8. Wooden box for sodium vapour lamp
9. Reading lens with torch
10. Sprit level.

MTECH P75 Diffraction grating Apparatus

OBJECT:- a) To determine the wavelength of main spectral lines of sodium lamp with the help of diffraction grating.

b) To determine the resolving power of plane diffraction grating.

Supplied complete with the following:

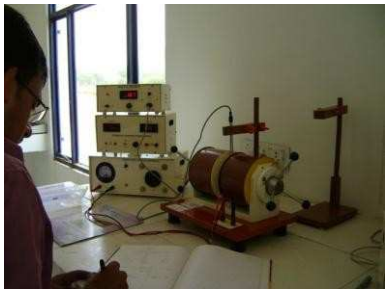
1. Grating 15000 Lines.
2. Prism DF/EDF.
3. Rectangular slit of variable width
4. Instruction manual
5. Philips Sodium Vapour lamp 35 Watt.
6. Transformer for sodium Vapour lamp 35 Watt.
7. Wooden box for (Sodium Vapour lamp)
8. Spectrometer 6 Inch.
9. Reading lens with torch
10. Sprit level.

MTECH P76 Planck`s Constant Apparatus

Object:-To determine the Planck`s constant value.
Supplied complete with the following:

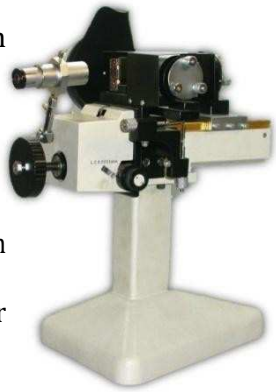
1. Power supply for Planck`s.
2. Photo cell.
3. Iron base light source.
4. Different type of Filters.

MTECH P77 Hall Effect Apparatus



This apparatus is used to determine the three parameters....
Hall co-efficient, carrier mobility, carrier density. The set up consists of Electromagnet of 7-5 K.G., Power Supply for Electromagnet 0-100V, 4 Amps with meter, Germanium Crystal mounted and its constant current power supply 0-20mA fitted with two Digital Meters for Halls Voltage and Crystal Current. Gauss Meter Digital 0-20K.Gauss with Hall Probe.

MTECH P78 Michelson interferometer with He-Ne Laser

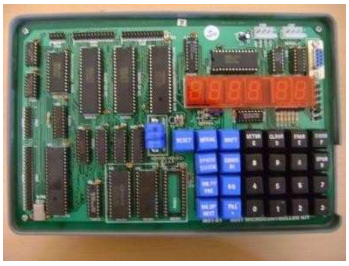


Objective:- To determine the wavelength of He-Ne Laser using Michelson Interferometer.
Moveable surface coated mirror.
Fixed surface coated mirror loaded with springs.
Compensator.
Beam Splitter.
Universal adjustable Telescope with cross line graticule. Diffused Glacc screen with pin-hole holder.
Main knobs for moving mirror no.1, lease count 0.01mm. Slow motion drum for moving mirror no.2, least count 0.0001mm.
Screw with nut & spring to adjust the view of pin hole in horizontal position.
Screw with nut & spring to adjust the view of pin hole in vertical position.
Base on stand for Interferometer.
3 knurled heads for adjusting the mirror no.2 parallel to no.1.
3 knurled heads for adjusting the mirror no.1 parallel to no. 2.
Well grounded Lead Screw with pitch 1 mm.
Pin hole disc.
Condenser unit (adjustable). Eyepiece (adjustable).
Spring knob for adjusting the lead screw. Viewing window to read main scale.
Telescope holding clamp (universal type).
Accessories:- Michelson Interferometer, He-Ne Laser 2mW, Meg. Lens & Iron Stand.

MTECH P79 GM Counter Experiment

Instrument consists of power supply for G.M. Tube with digital read out meter. 6 Digit counting system with its power supply. Controls for reset, start and stop through on panel. One presetable timer with 3 digit display and thumb wheel switch. Complete with G.M. Tube, stand, and one radioactive source Beta.
Accessories Supplied with setup:- G.M Counter power supply, GM Tube, Different types of sheets, Beta Source, Digital Multimeter.

MTECH P80 8085 Microprocessor in Built Power Supply



Based on 8085 CPU operating at 6.144 MHz crystal frequency
8K bytes of RAM available to the user
16 bit programmable TIMER/COUNTER using 8253.
24 programmable I/O lines provided through 8255.
RS-232C interface through SID/SOD Lines with Auto baud rate.
Two modes of commands: - Hex Key pad mode - Serial mode All address, data & control lines are buffered and made available at the edge connector as per STD bus configuration.
25/28 key hexadecimal keyboard and six seven segment displays through 8279.
Powerful software commands like Relocate, String, Fill, Insert, Delete, Block Move, Examine/Compare Memory, Examine Register, Insert Data, Delete Data, Single Step, GO.In-built Power supply

MTECH P81 Coherent Source Length & Time

Objective:- To determine the parameter of Coherent length & Time using He-Ne Laser.

Setup Contains following Accessories:-

1. Special Design Spectrometer without telescope & collimating lens.
2. He-Ne Laser 2mW.
3. Hiliger Transmission Grating 15000 Lines.
4. Digital detector with sensor.
5. Instruction Manual.

MTECH P82 Quinck`s Tube Method

To study susceptibility of Ferrous Solution in strong magnetic field, complete apparatus consisting of electromagnet of 7.5 K.G. strength with its Power supply 0-100V variable 4 Amps. Digital Gauss Meter 0-20 Kg with Hall Probe., Graduated Capillary tube with stand. Travelling Microscope also provide with this setup.

MTECH P83 Four Probe Method

Resistivity of Semiconductors by Four Probe Method at Different Temperatures and Determination of Band-Gap The experiment consists of the following :

1. Four Probe Arrangement
2. Oven (upto 200ºC)
3. Sample : Ge Crystal mounted
4. Thermometer (0-200ºC)
5. Four Probe Setup

(a) Constant Current power supply digital Accuracy:+0.25% of the reading+1 digit Load Regulation:0.03%for no load to full load

(b) Electronic Milli voltmeter 200 mV Accuracy: + 0.1% of reading = 1 digit Impedance: 1 M ohm Display: 3½ digit, 7 segment LED (12.5mm) height with auto polarity and decimal indication.

MTECH P84 e/m Helical Method

Having three major parts to measure electron for e/m by Helical Method,

1. Standard Solenoid of multi-turned layers fitted on wooden base.
2. Power supply, for cathode voltage to CRT. Provided with high resistance Voltmeter, also having solenoid supply with coarse and fine control arrangement, an ampere meter is used to measure current paccing in solenoid.
3. Cathode Ray Tube mounted to moveable inner side of the standard solenoid.

MTECH P85 e/m Thomson Method Apparatus

Supplied complete with the following:

1. e/m Thomson method power supply digital with intensity & focus control
2. CRT with octal cable.
3. Wooden Stand for CRT with Arms
4. Magnet Pair of good quality.
5. Compacc with wooden Stand.

MTECH P86 Faraday Rotation Setups

Setup Contains:-

1. He-Ne Laser:- A Laser Tube along with Power Supply are Housed in thick powered coated aluminum box , From Hole the laser beam comes out. It has also wavelength 6328 A`, Red Color, Random polarisation, 2mW.
2. Optical Bench:- With 1.5 Length Long S.S rods, two slow motion rider, two fixed rider , two stand.
3. A Soleniod rod with sample glacc rod (For Measure Vedent Constant)
4. Power Supply for Soleniod.
5. Ammeter for Measure Current.
6. Analyser & Polariser with rod.
7. Suitable Stand for Coil & Laser.
8. Photo Cell with multimeter.

MTECHP 87 Malus Law Experiment

1. He-Ne Laser:- A Laser Tube along with Power Supply are Housed in thick powered coated aluminum box , From Hole the laser beam comes out. It has also wavelength 6328 A`, Red Color, Random Polarisation, 2mW.
2. Optical Bench:- 1.5 Meter Optical Bench with S.S , Full Shaper.
3. Analyser & Polarizer:-This apparatus consist of two identical units , each provided with polaroid disc mounted in a rotatable mount , with aperture of 25mm.Thickness 0.1mm , Least Count 1 degree.
4. Detector with different voltage range.

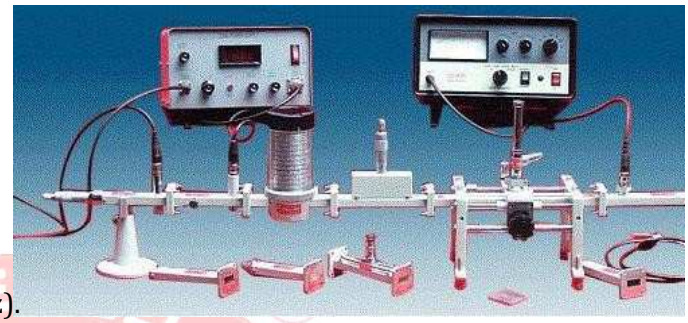
MTECH P88 Malus Law & Brewester Law Experiment

1. He-Ne Laser:- A Laser Tube along with Power Supply are Housed in thick powered coated aluminum box , From Hole the laser beam comes out. It has also wavelength 6328 A`, Red Color, Random Polarisation, 2mW.
2. Special Spectrometer without telescopes, also mounted long strip with equal interval with mounting provision.
3. Analyser & Polarizer:-This apparatus consist of two identical units , each provided with polaroid disc mounted in a rotatable mount , with aperture of 25mm.Thickness 0.1mm , Least Count 1 degree.
4. Detector with different voltage range.
5. Other Accessories:- Sample Glacc Plate, Magnifying Lens with LED.

MTECH P89 Reflex Klystron Microwave Bench

Experiment Perform:-

1. To study the characteristics of Reflex Klystron.
2. To study frequency, guided wavelength & free space wavelength.
3. To measure the SWR & reflection Coefficient.
4. To Measure the impedance of a load.
5. To study the attenuation loss of variable attenuator.
6. To study the loss of match termination & movable short.



Setup Contains:-

1. Klystron Digital Power Supply.
2. Klystron Tube for X band TE_{10} Mode.
3. Klystron Mount with Octal Connector.
4. Isolator (Two Port).
5. Variable Attenuator.
6. Direct Frequency Meter (9.8 to 12.5 GHz).
7. Slotted Section.
8. Tuning Probe.
9. Diode Detector.
10. Fixed Short.
11. Match Termination.
12. BNC to BNC Cable.
13. Analog VSWR meter.
14. Wave Guide Stand.
15. Cooling Fan.
16. Movable Short.

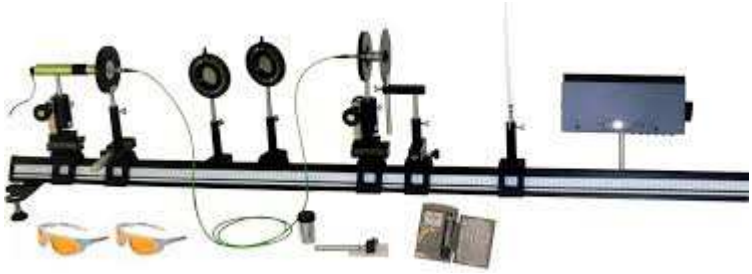
MTECH P90 Optical Fiber Characteristics Apparatus

This unit contains following experiments....

1. Study the attenuation & bending loss of fiber cable.
2. Study of numerical aperature.

Setup Contains following accessories...

1. An Optical bench with length 1.5 Mtr.
2. Diode Laser 5mW.
3. Optical Fiber cable.
4. Fiber Cable chuck holders.
5. Screen with paper clip.
6. Photo Diode.
7. Digital Multimeter.
8. Others:- Graph Book, Geomerty Box, Cladding samples for bending loss.



MTECH P91 Optical Bench 1.5 Mtr Length (Research)

Research optical bench:- the bed is a heavy cast channel with a strong central rib, thoroughly seasoned and aged before machining and grinding of its upper surface. The dimensions of the bed is approximately 180 cms x 12 cms x 16 cms. In size provided with heavy leveling screws. The scale is 170 cms. Long .

MTECH P92 Holographic Apparatus

A complete accembly in which we can perform many experiments with use of their helping tools, So setup contains following accessories are.

1. Honey comb Bench.
2. He-Ne Laser 2 mW.
3. Beam Spliter.
4. Uprights for clamping accessories.
5. Holography plate.
6. Dummy Toys & other image.
7. Big White Screen.
8. Helpful Chemicals.
9. Different Mirrors, Lens, Reflectors.
10. Different Mounters.

MTECH P93 Brewester Angle Apparatus

A Special spectrometer 6 Inch without telescope & collimating tube, Diode laser 5mW , Pair of Polaroid's, Different Prism:- EDF & Glacc, Photo Diode for detection, Digital Multimeter, Suitable accembly for mounting accessories.

MTECH P94 Ballistic Galvanometer Setup

Should have Phosphor Bronze type suspension wire, concave mirror reflector, coil resistance of 100 Ohms, Laser light source with 30-0-30 cm scale, including required power supply to operate on 220VAC supply and other accessories

Other Containing Technical Specification:-

1. Laser Used:- Diode Type with wavelength 635nm.
2. Regulated Power Supply:- 0-5 V, 250 mA.
3. Key Use:- Morse Key , Tapping Key.
4. Sample Capacitor & Resistance.
5. Stop Watch/Clock for Time Measurement.
6. DCC Wire, Spirit Level.

MTECH P95 Lloyd`s Mirror Experiment

An Optical Bench of 1.5 Mtr length of rod with dia 19mm, also with all uprights, 2 Slits, Lloyd`s mirror, 2 different lens with Dia 50mm., 2Eye-piece.

MTECH P96 Bi-Prism Experiment

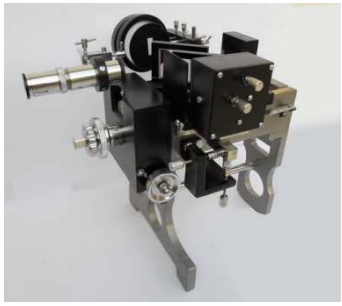
A heavy research optical bench 1.5 mtr with heavy upright, Biprism Accembly (Adjustable Slit, Biprism accembly, Lens holder, Eye-piece with micrometer, Biprism, different lens). Complete Sodium Light Source in metal body, Biprism 50x40, Convex Lens, Meg Lens with LED.

MTECH P97 Lambda of na light/ thickness of Mica Sheet

By using Fresnel Biprism method.

Setup Contains:- An Optical Bench 1.5 Mtr with S.S rod, fixed & movable riders (Qty-05 Nos), A sodium light source 35 Watt, Bi-Prism accembly, Biprism 40x50 mm, Convex lens, MICA Sheets with stand, Meg. Lens with LED.
OR

By using Michelson Interferometer.



Setup Contains:- A Michelson Interferometer percision type with mica sheets provision, A Sodium Light Source Accembly 35 Watt, Sample Mica Sheets, Meg. Lens with LED.

MTECH P98 Uo & Ue of using a fresnel biprism of calcite crystal for O-ray & e-ray

Setup Contains:- A Sodium light source with wooden box & transformer 35 Watt, Spectrometer 6 Inch dia, with L.C 1 Min, Fresnel Biprsim 40x50 mm, Calcite prism, Meg. Lens with LED, Spirit Level.

MTECH P99 High resistance by leakage method

Setup Contains:- A Ballastic Galvanometer 500 OHM, Lamp & Scale Arrangement, Morse key, Two way plug key, Fixed resistance Meg Ohm one dial box, Fixed Capacitor of single dial box, regulated power supply (0-5)V, 250 mA, DCC wire, Digital Stop Watch, Spirit Level.

MTECH P100 Brewster`s angle constant refraction index of ion/liquid using He-Ne Laser

Setup Contains:- A He-Ne laser 2 mW with suitable stand, A Special Spectrometer 10 Inch dia with L.C -30 sec without telescope & collimating tubes, Glacc plate, Liquid vessel with two sample liquids, Photo Cell with digital table top current meter with different ranges, pair of polariods, spirit level, Meg. Lens with LED.

MTECH P101 Malus law verification using He-Ne Laser

Setup Contains:- An optical bench 1.5 Mtr with S.S rod with four riders, He-Ne Laser 2 mW, Pair for Polariods, Photo Cell with digital multimeter.

MTECH P102 Refraction index of liquid using diode laser

Setup Contains:- A Special Spectrometer 7 Inch with LC 30 Sec, Diode Laser 5 mW, Liquid Vessel with two different liquids, EDF Hollow prism, photo cell with Digital Multimeter

MTECH P103 Determination of slit width & lambda for laser light

Setup Contains:- An optical bench 1.5 mtr with S.S rods with four rides, He-Ne laser with suitable stands, Sample different width wire, slits, diffraction grating, Screen with graph paper with paper clips.

MTECH P104 Study of divergence of laser beam & beam diameter

Setup Contains:- He-Ne laser with suitable stands, Inch tape 5/10 Mtr, Screen with graph paper with paper clips with suitable stand, dia special measurer.

Basic Electronics & Electrical Lab

MTECH P105 Training Board for Different Biasing Circuits

Objective:- To study of different Biasing Circuit for Transistor such as Fixed Bias Method, Collector to Base Bias, Emitter Resistor Bias and Voltage Divider Bias methods.
Features:- Instrument comprises of DC Regulated Power Supply, One NPN transistor, 2 round meters to measure the voltage and current, Different type of Resistances connected inside.
supplied with wooden Cabinet.

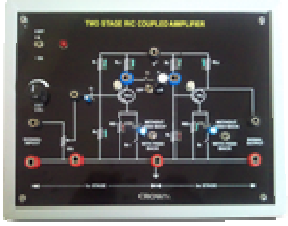
MTECH P106 Training Board for HWR, Full wave rectifier & Filters

Objective :- To study Efficiency & Ripple factor in case of Half wave, Full wave rectifier on application of load & filters.
Features :- Instrument comprises of AC Power Supply, 2 meters to measure Output Voltage & Output current, 4 PN Junction Diodes, Filter Circuit Kit, load Resistances selectable using band switch.
supplied with wooden Cabinet.

MTECH P107 Training Board for Voltage Multiplier Circuits

Objective:-To study Voltage multiplication using Diodes, Resistances & Capacitors.
Features:- Instrument comprises of AC Power Supply with Output selectable using band switch, Circuit diagram of Doubler and Tripler Printed & Components mounted on the front panel.
supplied with wooden Cabinet.

MTECH P108 Training Board for Emitter Follower Circuit

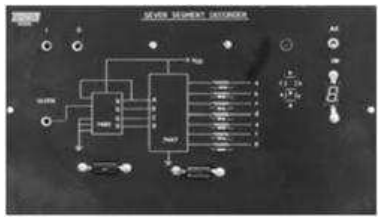


Objective:- To study Frequency Response, Input Impedance & Output Impedance of common Collector Transistor Amplifier.
Features:- Instrument comprises of DC Regulated Power Supply, Circuit diagram is printed, components mounted on the front panel.
supplied with wooden Cabinet.

MTECH P109 Training Board for Light depend Characteristics

Objective:- To study the characteristics for Photo conductor, photovoltaic cell, Photo conductive.
Features:- Instrument comprises of Analog Meters, Circuit diagram is printed, components mounted on the front panel.
supplied with wooden Cabinet.

MTECH P110 Training Board for Seven Segment Display Trainer



Objective:- To Verify truth table for seven segment display using IC-7447.
Features:- Instrument comprises of DC Regulated Power Supply 5VDC/150mA, 4 SPDT switches provided for selecting logic '1' & logic '0',1Hz , FND output indicators, Circuit diagram for IC7447 & 7-segment display printed & connections for various inputs & outputs brought out at the sockets on the front panel.
supplied with wooden Cabinet.

MTECH P111 Training Board for E & D type MOSFET

Objective :- To plot VDS versus I,D for different values of VGS.
Features :- Instrument comprises of Two DC Regulated Power Supplies 0-5 VDC/150mA & 0-25VDC/150 mA, three round meters for voltage & current measurement, one MOSFET IRF 840 mounted behind the panel, connections of Supplies, Meters & MOSFET brought out at 4mm Sockets.
supplied with wooden Cabinet.

MTECH P112 Training Board for Transformer Coupled Amplifier

Objective:- Study of Voltage Gain and Frequency Response of a Transformer Coupled Amplifier.
Features:- Instrument comprises of DC Regulated Power Supply, Circuit diagram is printed, components mounted on the front panel.
supplied with wooden Cabinet.

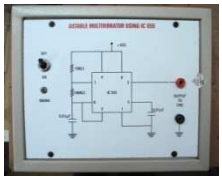
MTECH P113 Training Board for Hartley Oscillator

Objective:-To study the Frequency and Wave shape generated by a Hartley Oscillator.
Features:-Instrument comprises of 12V DC Regulated Power Supply, circuit diagram printed & components mounted on front panel.
supplied with wooden Cabinet.

MTECH P114 Training Board for Monostable Multivibrator

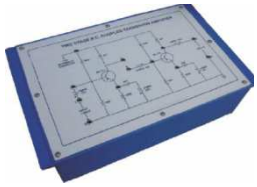
Objective:-To accemble & study Monostable Multivibrator.
Features:- Instrument comprises of DC Regulated Power Supply 5 VDC/150mA, 555 & various components kept inside the cabinet & connections brought out at 4mm sockets.
supplied in wooden cabinet.

MTECH P115 Training Board for Astable Multivibrator



Objective:- To accemble & study Monostable Multivibrator.
Features:- Instrument comprises of DC Regulated Power Supply 5 VDC/150mA, 555 & various components kept inside the cabinet & connections brought out at 4mm sockets.
supplied in wooden cabinet.

MTECH P116 Training Board for Two Stage RC Coupled Amplifier

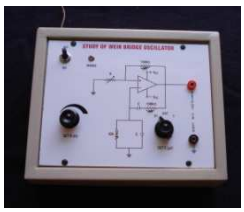


Objective:- To study Frequency Response of Single stage & two stage RC coupled Common Emitter Transistor Amplifier.
Features :- Instrument comprises of DC Regulated Power Supply, Circuit diagram is printed, components mounted on the front panel.
supplied in wooden cabinet.

MTECH P117 B-H Curve Apparatus

B-H Curve Apparatus is used to trace Hysteresis curves on CRO using Resistance, Capacitance & Inductance. The Apparatus comprises of AC Power Supply 3-15 VAC and has the provision for connecting external inductance. Variable Rheostat for shift.
Optional Accessories Required:- CRO Dual Channel.

MTECH P118 Training Board for Wien Bridge Oscillator



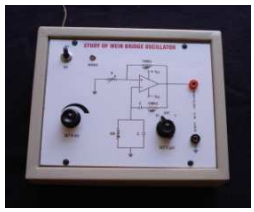
Objective:-To study the Frequency and Wave shape generated by Wein Bridge Oscillator.
Features:- Instrument comprises of 12V DC Regulated Power Supply, Circuit diagram printed & components mounted on front panel.

MTECH P119 Transistor Characteristics Apparatus

Object Contains:- To Study the Characteristics of PNP & NPN of Transistor.
Setup Supplied with following Accessories.

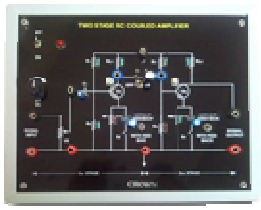
1. An Electronic unit which is consist of 0-10 volts continuously variable solid state separate power supplies for base-emitter and collector emitter junction,
2. 2 transistors (NPN and PNP).
3. Two DC Voltmeters 65 mm round dial with switch selectable, Two DC Voltmeter 65mm round dial with switch selectable range of 1V and 10V.
4. Patch Cords & Instruction Manual.

MTECH P120 Training Board for RC Phase Shift Oscillator



Objective:- To study the Frequency and Wave shape generated by RC Phase Shift Oscillator.
Features:- Instrument comprises of 12V DC Regulated Power Supply, Circuit diagram printed & components mounted on front panel.
supplied in wooden cabinet.

MTECH P121 Training Board for Colpitt`s Oscillator



Objective:- To study the Frequency and Wave shape generated by a Colpitt's Oscillator.
Features:- Instrument comprises of 12 V DC Regulated Power Supply, Circuit diagram printed & components mounted on front panel.

MTECH P122 BJT `H` Parameter kit

Aim:- Calculation of 'H' Parameters, such as current gain, input impedance, output impedance and reverse feedback ratio.
An Electronics devices with inbuilt of Two DC Regulated Power Supplies 0-10VDC/150mA, 0-1VDC/150mA, Four round meters for Voltage & Current, One PNP Transistor mounted behind the panel, connections of Supplies, Meters & Transistor brought out at 4mm Sockets.

MTECHP123 FET Characteristics Apparatus

Aim:- To Plot the V-I Characteristics of FET & measure their parameters.
Specification:-An Electronics device with inbuilt of Two DC Regulated Power Supplies 0-15VDC/150mA & 0- 3VDC/150mA, three round meters for voltage & current measurement, FET BFW10 mounted behind the panel.

MTECH P124 SCR Characteristics Apparatus

Aim:- To plot Anode current Vs Anode Cathode Voltage Characteristics. Gate Characteristics (Open Gate), Gate Characteristics (Gate connected).
Specification:- An Electronics Devices with inbuilt of two DC Regulated Power Supplies 0-30VDC/150mA & 0-1VDC/150mA, three round meters for voltage & current measurement, SCR 2P4M mounted behind the panel, connections of Supplies, Meters & SCR brought out at 4mm Sockets.

MTECH P125 DIAC characteristics Apparatus

Aim:- To Plot the V-I Characteristics of DIAC.
Specification:- An Electronics devices with inbuilt of DC Regulated Power Supply 0-50 VDC/150mA, two round meters for voltage & current measurement, one Diac mounted behind the panel, connections of Supplies & Diac brought out at 4mm Sockets.

MTECH P126 TRIAC Characteristic s Apparatus

AIM:- To study the V-I Characteristics of TRIAC.
Specification:- An Electronics devices with of two DC Regulated Power Supplies 0-30VDC/150mA & 0-5 VDC/150mA, three round meters for voltage & current measurement, Triac mounted behind the panel, connections of Supplies & Triac brought out at 4mm Sockets.

MTECH P127 Tetrode Characteristics Apparatus

An Electronics unit consist of Two DC Regulated Power Supplies 0-300VDC/30mA & One 0-15 VDC/10mA, AC Power Supply 6.3 VAC/1Amp, four round meters for voltage & Current measurement, valve diagram is Printed on Front panel, connections of Supplies & Valve brought out at 4mm Socket/Terminals. ,also mounted tetrode valve.

MTECH P128 Pentode Characteristics Apparatus

An Electronics unit consist of Two DC Regulated Power Supplies 0-300VDC/30mA & One 0-15 VDC/10mA, AC Power Supply 6.3 VAC/1Amp, four round meters for voltage & Current measurement, valve diagram is Printed on Front panel, connections of Supplies & Valve brought out at 4mm Socket/Terminals & also mounted pentode valve.

MTECH P129 Zener Diode Characteristics Apparatus

An Electronics unit consist of DC Regulated Power supply 0-15VDC/150mA, two round meters for voltage & current measurement, 3 Zener Diodes mounted behind the panel, connections of Supplies, meters & Zener Diode brought out at 4mm Sockets.

MTECH P130 P-N Junction Diode Characteristics Apparatus

An Electronics unit consists of two DC Regulated Power Supplies 0-3VDC/150mA & 0-30 VDC/150mA, two dual range round meters for voltage & current measurement, PN Junction Diodes mounted behind the panel, connections of Supplies, Meters & Diodes brought out at 4 mm Sockets.

Applied Mechanics lab

MTECH P131 Polygon Force Apparatus

Object Contains:- Verifying the law of Polygon force.
Setup Supplied with following Accessories.

1. Consisting of wooden board of 50 x 60 cm size, provided with two wall brackets
2. Four adjustable frictionless aluminum pulley
3. Five sets of slotted weights of iron Nickel led each set containing four weight and one hanger of 50gms.

MTECH P132 Bell Crank Lever Apparatus

Object Contains:- To verify the principle of moments using bell crank lever.
Setup Supplied with following Accessories.

1. A teak wooden right angled lever with fulcrum at the angle, the horizontal arm is of 75 cm and vertical arm is of 20 cm, a bracc spring balance capacity of 20kg and least count of 0.5kg with adjustable wing nut is attached to the shorter arm.
2. The lever arm is with scale and grooved at every 5 cm complete
3. One sliding weight of 1 Kg.

MTECH P133 Compound Lever Apparatus

Object Contains:- To verify the principle of moments using Compound lever.
Setup Supplied with following Accessories.

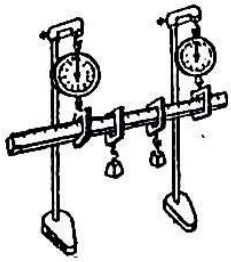
1. Comprising of two iron beams are connected to each other and fitted on two different stands, well balanced with a scale pan. All metal parts fitted on wooden polished base.
2. Fixed Conical 1 kg. weight
3. Physical iron Nickel led weight box 1-50 gms.

MTECH P134 Simply Supported Beam Apparatus

Object Contains:- To verify the principle of forces in beam of Parallel Forces Apparatus with the help of beam supported at its ends.
Setup Supplied with following Accessories.

1. Comprising of two iron beams 25x2.5 mm connected to each other and fitted on two different stands, well balanced with a scale pan. All metal parts fitted on wooden polished base.
2. Fixed Conical 1 kg. weight
3. Physical iron Nickel led weight box 1-50 gms.

MTECHP135 Overhang Beam Apparatus



Object Contains:- To verify the principle of forces in beam of Parallel Forces Apparatus using Overhang Beam Apparatus.
Setup Supplied with following Accessories.

1. The apparatus is with two circular dial type 10 Kg extension spring balances. Complete with suitable stands, all wooden beam with scale and slots at regular intervals
2. Four stirrups, hooks
3. Two 1 Kg weights.

MTECH P136 Friction Slide Apparatus

Object Contains:- To determine of coefficient of friction by Inclined Plane Apparatus.
Setup Supplied with following Accessories.

1. It consists of a wooden board a with glacc top hinged on an iron base to which a sector with graduated arc and vertical scale is provided. The plane may be clamped at any angle, A frictionless pulley is attached to the end by means of a clamp adjustable to any necessary position.
2. One set of three wooden carriages with different bottom surface (wooden, glacc and iron)

MTECH P137 Differential Wheel & Axle Apparatus

Object Contains:- To determine the efficiency of Wheel & differential axle.
Setup Supplied with following Accessories.

1. It is combination of Wheel of axle having dia of giving a ratio of 1:2:4. A steel axle pacces through the centre of the wheel which is mounted on ball bearing in cast iron brackets reducing friction to minimum. The base has holes to fix the apparatus on wall.
2. Cotton Thread.
3. Snatch Pulley.
4. Hooks.

MTECH P138 Worm & Worm Wheel Apparatus

Object Contains:- To determine the efficiency of Worm & Worm Wheel.
Setup Supplied with following Accessories.

1. It is consisting of a machine cut worm gear of 25 cm dia carrying a metal drum of 12 cm dia and machine cut worm on steel spindle carrying a12cm dia pulley. The whole arrangement is fixed on heavy cast iron bracket capable to be fixed to a wall. Complete with effort pulley,
2. Cotton Thread.
3. Hooks.

MTECH P139 Screw Jack Apparatus

Object Contains:- To determine the mechanical advantage, velocity ratio & efficiency of screw thread using Screw Jack Apparatus.
Setup Supplied with following Accessories.

1. All metallic construction accurately machine cut screw with a pitch of carrying double flanged turn table of about 20 cm dia. Fitted on a heavy cost iron base and complete
2. Two adjustable pulleys .
3. Cotton Thread.
4. Hooks

MTECH P140 Winch Crab Single Purchase Apparatus

Object Contains:- To determine the efficiency of Winch & Crab Lifting.
Setup Supplied with following Accessories.

1. It is consist of Rack & Pinion combination which run with the help of Effect less pulley, Drum which is fitted with heavy cast iron wall brackets. The grooved wheel is of 25 cm dia. and gears are machine cut.
2. Cotton Thread.
3. Hooks.

MTECH P141 Winch Crab Double Purchase Apparatus

Object Contains:- To determine the efficiency of Winch & Crab Lifting for double purchase combination.
Setup Supplied with following Accessories.

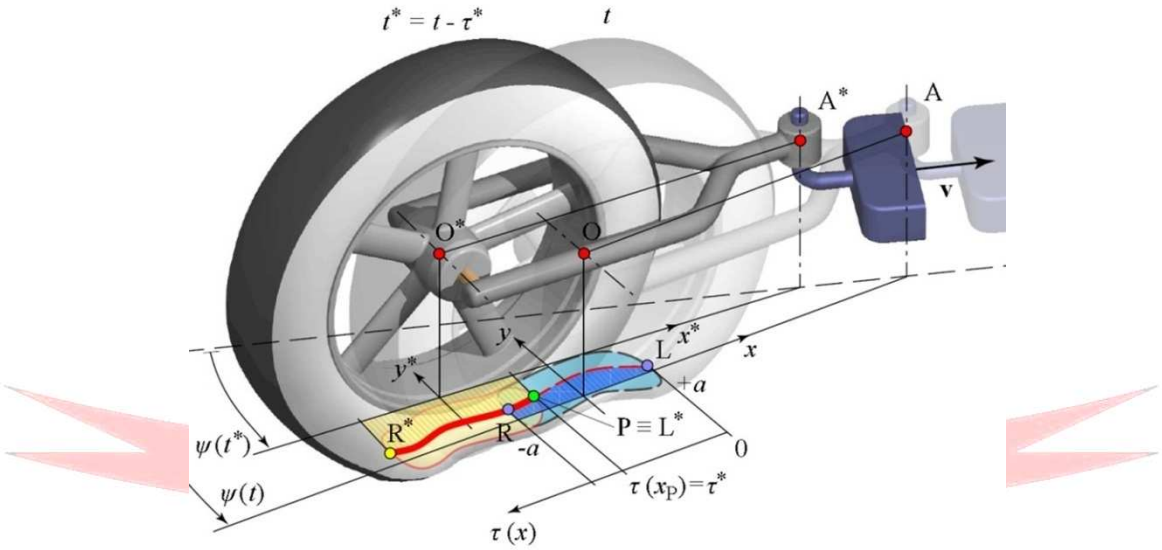
1. It is consist of Rack & Pinion combination which run with the help of Effect less pulley, Drum which is fitted with heavy cast iron wall brackets. The grooved wheel is of 25 cm dia. and gears are machine cut for double purchase system.
2. Cotton Thread.
3. Hooks.

MTECH P142 Simple Jib Crane Apparatus

Object Contains:- To determine the stress of jib through spring.

Setup Supplied with following Accessories.

1. A unit consisting of a tubular compression balance pivoted about an axis & fitted to the base. The tie chain has an adjustable angel bracket and fitted with a 10 Kg extension balance. Complete on wooden base.
2. External Tubular Spring Balance 10 Kg.
3. Tie Chain.
4. Hook.



Measurement Lab Instruments

MTECH P143 De-Sauty Bridge (DPM Model)

This bridge is used to measure the unknown value of capacitance .An Electronics unit with inbuilt Fixed Oscillator with 1 KHz Frequency , Digital Display for Null Detector, Mounted Decade Dial type discrete components R & C, One Unknown Sample, Supplied in Ply Wooden Cabinet, Patch Cords & Manual.

MTECH P144 Calibrate an Ammeter using DC Slide Wire Potentiometer

Accessories supplied with the experiments:-

1. High precision DC Slide wire potentiometer (Round dial type) with coarse and fine potentiometers and terminal for inserting patch cords, duly cased in a wooden casing.
2. DC Source (0-5)V, (0-1)A
3. Ammeter and Galvanometer mounted on the different wooden casing with variable resistances and resistance network on it.
4. Standard cell electronic type.
5. Unknown variable supply.
6. Connecting wire & Manual.

MTECH P145 Calibrate a Voltmeter using Crompton Potentiometer

Accessories supplied with the experiments:-

1. High precision Crompton potentiometer (Round Dial type) with coarse and fine potentiometer and terminal for inserting patch cords, duly cased in a wooden casing.
2. DC Source (0-5)V, (0-1)A.
3. Ammeter and Galvanometer mounted on the different wooden casing with variable resistances and resistance network on it.
4. Standard Cell Electronic type.
5. Unknown variable supply.
6. Connecting wire & Manual.

MTECH P146 Measure Low Resistance by Kelvin's Double Bridge

This bridge is very suitable for the use of wires and cables manufacturers. It is being extensively used for finding the resistance of transformer windings, contact resistance of relay etc.

Standard Resistance.

There are 10 coils of 0.01 ohm each arranged on a rotary dial plus a circular slide wire of total resistance 0.01 ohm and 500 sub-division. Each sub-division is equal to 0.00002 ohms on the normal range.

Multiplying Ratio

A rotary switch furnishes 5 multiplying ratio of x100, x10, x1, x0.1 and 0.01 range of measurement.

The bridge has a range of 0.2 micro ohm to 11 ohms.

Setup Supplied with Other accessories:-

DC Regulated Power Supply (0-10)V & (0-5)A.

Galvanometer 30-0-30 & Patch Cords

MTECH P147 Industrial Kelvin double Bridge

Range: 0.2 micro ohm to 11 ohm with Accessories – a) Spot Reflecting Galvanometer, b) Heavy Duty DC Source, c) Conductivity attachment 100cm complete in all respect with enclosure.

Other Containing Technical Specification:-

1. Industrial Kelvin Double Bridge:- A Wooden Housing with containing Different decade dials, Slide wire dial, Pulser Switch.
2. Conductivity Attachment:- Wooden Unit with heavy Terminal & Strips, Sample Wire.
3. Spot Reflection:- Transparent Display, Decade for Set the resistance.
4. Heavy DC Source:- Regulated 0-8 V, 0-10 A with analog meter.

Other Equipments

MTECH P148 Audio Signal Generator

An Electronic Device which is very useful & versatile laboratory instrument & it provides three basic waveform-sine, square & triangular.

1. **Frequency Range:-** 1 Hz to 100 KHz.
2. **Input Voltage:-** 220V, 50 Hz.
3. **Output Voltage:-** 0-15/20V Peak to Peak Cont. Variable.
4. **Output Impendence:-** 50 Ohm.
5. **Attenuator:-** 60 dB.
6. **Housed Cabinet:-** Metallic/Bakelite.

MTECH P149 Analog Multimeter

An instrument which is mostly use for measurement in laboratory to measure voltage, resistance, Current.
Measured Resistance Range:- Up to 20M ohm.
Analog multi meter with 20 K ohm/Volt 1% accuracy
D.C. Voltage Measurable Range:- Up to 2500 VDC Max.
A.C. current range also available.

MTECH P150 Digital Multimeter

An instrument which is mostly use for measurement in laboratory to measure voltage, resistance, Current.
Measured Resistance Range:- Up to 20M ohm.
Hand held digital multimeter3 & 1/2 digit 0.3% accuracy 1000 VCD
D.C. Voltage Measurable
A.C. current range also available.
Range protected against transients

MTECH P151 Single Channel CRO

An instrument which is mostly use for measurement in laboratory to measure Time Period of frequency, Amplitude.
Input Voltage:- 220V, 50 Hz.
Frequency Range:- Up to 10 MHz.
Sensitivity:- Up to 5 mV.
Single Trace Oscilloscope with component Tester.
Supplied with Power Cord, BNC Cable & Manual.

MTECH P152 Regulated Power Supply

An Electronic device which provide regulated DC voltage variable.
Input Voltage:- 220 V , 50 Hz.
Output Voltage:- 0-30 V Variable.
Output Current:- 0-1 A Variable.
Regulation:- With 0.1% Accuracy.
Utility:- Overload protection, Short Circuit Protection.
Display:- FND.
Cabinet:- Metallic.

MTECH P153 CRO 20MHz dual channel

1. CRO Frequency Range:- 20 MHz.
2. Channel:- Dual.
3. Voltage Range:- 20 V.
4. External Trigg Option.
5. In Built Power Supply.
   Accessories:- CRO, BNC Cable & Power Cords.

MTECH P154 Faraday Setup (For Electromagnetic Induction)

This kit basically divided into two part, first is metallic unit which consist of tripod iron base with semi circular ring which is pacces through sample coil for produce e m f, fixed bracc weights, Second unit consist of electronics which contains analog meters for current & voltmeter, mounted discrete components R,C & Diode supplied with suitable patch cords.