

**Dr. Babasaheb Ambedkar
Marathwada University,
Aurangabad**

Practical Slips

B.Sc. F.Y., S.Y., T.Y.

Sub.:-

Instrumentation Practice

**Dr.Babasaheb Ambedkar Marathwada University, Aurangabad
Instrumentation Practice F.Y.B.Sc. Practical III**

1. Study of Resistances in series and parallel & Study of Ohm's Law.

Find the values of 20 given resistances using colour codes.

Make 10 series combinations, find their values.

Make 5 parallel combinations, find their values.

Verify Ohm's law.

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2. Study of Kirchhoff's voltage and current Laws.

Draw the circuit for verification of Kirchhoff's Law.

Build the circuit.

Take the Observations.

Verify Kirchhoff's Law.

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3. Study of Capacitances in series and parallel.

Find the values of 10 given capacitances using colour codes or other codes.

Make 5 series combinations, find their values.

Make 5 parallel combinations, find their values.

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4. Study of Transformers.

You are given different transformers.

Categorize the transformers.

For given Step- down transformer find the response for different input voltages.

For given Step- down transformer find the response for different input voltages.

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5. Characteristics of rectifier diode.

**Draw the Circuit Diagram to find the Characteristics of rectifier diode
Build the Circuit.
Take the Observations.
Plot the graph of Forward and Reverse bias on the same graph paper.**

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6. Characteristics of zener diode.

**Draw the Circuit Diagram to find the Characteristics of zener diode
Build the Circuit.
Take the Observations.
Plot the graph.**

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7. Characteristics of Varactor diode

**Draw the Circuit Diagram to find the Characteristics of Varactor diode
Build the Circuit.
Take the Observations.
Plot the graph .**

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8. Characteristics of Displays.

**You are given a 7- Segment display.
Apply the Voltages, to create numbers 0 to 9.**

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9. Characteristics of npn transistor.

**Draw the Circuit Diagram to find the Characteristics of npn transistor
Build the Circuit.
Take the Observations.
Plot the graph .**

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10. Characteristics of pnp transistor.

**Draw the Circuit Diagram to find the Characteristics of pnp transistor
Build the Circuit.
Take the Observations.
Plot the graph .**

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11. Study of Transistor amplifier.

**Draw the Circuit Diagram to study the transistor amplifier
Build the Circuit.
Take the Observations.
Plot the graph .**

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12. Study of Photovoltaic cell.

**Draw the Circuit Diagram to study the Photovoltaic cell.
Build the Circuit.
Take the Observations.
Plot the graph .**

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13. Study of Photo-Transistor .

Draw the Circuit Diagram to study the photo-transistor
Build the Circuit.
Take the Observations.
Plot the graph .

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14. Study of IC 741 .

Draw the Circuit Diagram to study the IC 741 in Inverting mode
Build the Circuit.
Take the Observations.
Plot the graph .

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15. Study of Relays and Circuit Breakers.

You are given a few relays.
Study their performance using in a proper circuit.

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16. Study of IC 555 as astable multivibrator .

Draw the Circuit Diagram to study the IC 555 as astable multivibrator
Build the Circuit.
Take the Observations.
Find the frequency of oscillations.

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1. Study of errors in measurements

**Note different types of errors that occur in measurements.
Show them practically.**

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2. Study of D.C. and A.C. meters.

**You are given different meters.
Classify them into a.c. or d.c. and the range of these meters.
Find least count of every meter.**

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3. Study of meter sensitivity.

For the given meters , practically find the sensitivity of the meters.

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4. Study of Thermocouple type current meters.

**Draw the Circuit Diagram to study the Thermocouple type current meter.
Build the Circuit.
Take the Observations.**

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5. Study of Analog and Digital multimeters.

You are given the analog and a digital multimeter.
Find the values of the given resistances with these meters.
Measure a.c. and d.c. voltages using these meters.

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6. Study of D.C. Wheatstone bridge.

Draw the Circuit Diagram to study the D.C. Wheatstone bridge.
Build the Circuit.
Take the Observations.

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7. Study of Maxwell's bridge.

Draw the Circuit Diagram to study the Maxwell's bridge.
Build the Circuit.
Take the Observations.

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8. Study of Hey's bridge.

Draw the Circuit Diagram to study the Hey's bridge.
Build the Circuit.
Take the Observations.

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9. Study of Schering's bridge.

Draw the Circuit Diagram to study the Schering's bridge.
Build the Circuit.
Take the Observations.

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10. Study of Phase Detector.

Draw the Circuit Diagram to study the Phase Detector.
Build the Circuit.
Take the Observations.

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11. Study of Potentiometer.

Draw the Circuit Diagram to study the Potentiometer.
Build the Circuit.
Take the Observations.

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12. Study of Cathode Ray Tube.

Draw the Diagram to study the Cathode Ray Tube.
Observe the deflections by applying different potentials.
Take the Observations.

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13. Measurement of Frequency using Cathode Ray Oscilloscope

Find the frequency of an a.c. signal using C.R.O.
Repeat the observations for 15 different frequencies.

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14. Measurement of a.c. and d.c. voltages using Cathode Ray Oscilloscope

Find the a.c. voltage of an a.c. signal using C.R.O.
Repeat the observations for 10 different frequencies.
Find the d.c. voltage of an d.c. signal using C.R.O.
Repeat the observations for 5 different positions.

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15. Study of Lissajous figures using C.R.O.

Apply two different a.c. signals to X and Y inputs of the C.R.O.
Obtain the Lissajous figures with one, two, three and four vertical and horizontal loops.
Take the Observations.

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1. Study of Inverting Amplifier .

Draw the circuit of Inverting Amplifier.
Build the circuit.
Take the Observations.
Plot the graph.

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2. Study of Non-inverting Amplifier .

Draw the circuit of Non-inverting Amplifier.
Build the circuit.
Take the Observations.
Plot the graph.

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3. Study of Offset null arrangement .

Draw the circuit used for Offset null arrangement.
Build the circuit.
Take the Observations.
Plot the graph.

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4. Study of Instrumentation Amplifier .

Draw the circuit of Instrumentation Amplifier.
Build the circuit.
Take the Observations.
Plot the graph.

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5. Study of Load and Line regulation of IC 7805.

**Draw the circuit used for Load and Line regulation of IC 7805.
Build the circuit.
Take the Observations.
Plot the graph.**

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6. Study of Load and Line regulation of IC 7905.

**Draw the circuit used for Load and Line regulation of IC 7905.
Build the circuit.
Take the Observations.
Plot the graph.**

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7. Study of Load and Line regulation of IC LM317

**Draw the circuit used for Load and Line regulation of IC LM317.
Build the circuit.
Take the Observations.
Plot the graph.**

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8. Study of IC 555 as astable multivibrator .

**Draw the Circuit Diagram to study the IC 555 as Astable Multivibrator
Build the Circuit.
Take the Observations.
Find the frequency of oscillations.**

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9. Study of IC 555 as Monostable multivibrator .

**Draw the Circuit Diagram to study the IC 555 as Monostable Multivibrator
Build the Circuit.
Take the Observations.**

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10. Study of V.C.O. using IC 566..

**Draw the Circuit Diagram to study the IC 566 as Voltage Controlled
Oscillator.
Build the Circuit.
Take the Observations.**

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11. Study of Function Generator IC 2206.

**Draw the Circuit Diagram to study the IC 2206 as a Function Generator
Build the Circuit.
Take the Observations.**

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12. Study of Function Generator IC 8038.

**Draw the Circuit Diagram to study the IC 8038 as a Function Generator
Build the Circuit.
Take the Observations.**

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13. Study of OP-AMP as summing Amplifier.

**Draw the Circuit Diagram to study the IC 741 as summing Amplifier
Build the Circuit.
Take the Observations.**

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14. Study of OP-AMP as Difference Amplifier.

**Draw the Circuit Diagram to study the IC 741 as Difference Amplifier
Build the Circuit.
Take the Observations.**

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1. Verification of Basic Gates.

**Draw the 1. AND 2. OR 3. NOT gate symbols.
Note the truth tables of these basic gates.
Verify the truth tables.**

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2. Study of NAND and NOR gates as universal building blocks.

**Draw the circuits of AND, OR and NOT gates using NAND gates.
Build the circuit.
Verify the truth tables**

**Draw the circuits of AND, OR and NOT gates using NOR gates.
Build the circuit.
Verify the truth tables.**

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3. Study of de Morgan's theorems.

Note the de Morgan's theorems.

Build the circuit.

Verify the truth tables.

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4. Study of Decoder.

Draw the Circuit Diagram of Decoder.

Build the Circuit.

Take the Observations.

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5. Study of Multiplexer.

Draw the Multiplexer circuit.

Build the circuit.

Take the Observations.

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6. Study of Demultiplexer.

Draw the demultiplexer circuit.

Build the circuit.

Take the Observations.

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7. Study of JK Flip-flop, D FF and T FF.

Draw the JK Flip-flop, D FF and T FF circuits.

Build the circuit.

Take the Observations.

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8. Study of Four bit Asynchronous Counter.

Design and draw the Four bit Asynchronous Counter circuit.

Build the circuit.

Take the Observations.

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9. Study of Mod-8 Synchronous Counter.

Design and draw the Mod-8 Synchronous Counter circuit.

Build the circuit.

Take the Observations.

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10. Study of Universal Shift Register using IC 7495.

Design and draw the Shift Register using IC 7495 circuit.

Build the circuit.

Take the Observations.

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11. Study of Ring and Johnson Counters.

**Design and draw the Ring and Johnson Counters circuits.
Build the circuit.
Take the Observations.**

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12. Study of 8-bit Digital to Analog Converter.

**Draw the circuit for 8-bit Digital to Analog Converter.
Build the circuit.
Take the Observations.
Plot the graph.**

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13. Study of 8-bit Analog to Digital Converter.

**Draw the circuit for 8-bit Analog to Digital Converter.
Build the circuit.
Take the Observations.
Plot the graph.**

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1. Study of Resistance as a displacement Transducer .

Draw the circuit for use of a variable resistor as a displacement transducer.

Build the circuit.

Take the Observations.

Plot the graph.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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2. Study of Thermistor as a temperature transducer.

Draw the circuit for Thermistor used as a temperature transducer .

Build the circuit.

Take the Observations.

Plot the graph.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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3. Study of LVDT.

Draw the circuit for Linearly variable differential transformer (LVDT).

Build the circuit.

Take the Observations.

Plot the graph.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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4. Measurement of divergence of a laser beam.

For the laser beam provided to you, find the divergence of the laser beam.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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5. Determination of random sugar contents in blood using glucometer.

You are provided a digital glucometer. Find the random sugar of a person.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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6. Measurement of Skin Resistance by GSR meter

Draw the circuit for Skin Resistance measurement.

Build the circuit.

Take the Observations.

Plot the graph.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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7. Measurement of Respiration Rate by respiration rate meter

Draw the circuit for respiration rate measurement.

Build the circuit.

Take the Observations.

Plot the graph.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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8. Measurement of Red Blood Cells

Arrange the experiment to measure RBC's.

Take the Observations.

Plot the graph.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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1. Characteristics of Photo diode .

Draw the circuit for plotting the characteristics of photo-diode

Build the circuit.

Take the Observations.

Plot the graph.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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2. Study the Variation of Blood-Pressure with time using EXCEL .

You are given the data for Blood-Pressure of a person against time.

Plot the graph using EXCEL.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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3. Study of Digital to Analog Converter.

Draw the circuit for Digital to Analog Converter.
Build the circuit.
Take the Observations.
Plot the graph.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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4. Study of Analog to Digital Converter.

Draw the circuit for Analog to Digital Converter.
Build the circuit.
Take the Observations.
Plot the graph.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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5. Measurement of Blood-Pressure by Manometer Apparatus.

Using Manometer B.P. measuring apparatus measure B.P. for one hour for every 10 minutes.

Take the Observations.

Plot the graph.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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6. Measurement of Blood-Pressure and Pulse Rate by electronic digital Apparatus.

Using electronic digital apparatus measure B.P. for one hour for every 3 minutes.

Take the Observations.

Plot the graph.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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7. Study of variation of Oxygen contents of blood using Oxymeter.

You are provided an Oxymeter.

Put your finger in and note the Oxygen contents for every 3 minutes.

For one hour continue the observations.

Plot the graph.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :

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8. Measurement of White Blood Cells

Arrange the experiment to measure WBC's.

Take the Observations.

Plot the graph.

EXPERIMENT:

PROJECT :

INDUSTRIAL VISIT :

TOTAL :
