VINAYAKA MISSION'S RESEARCH FOUNDATION

AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY, PAIYANOOR

BASIC ELECTRICAL ENGINEERING LABORATORY

STANDARD OPERATING PROCEDURE

Name of the Lab./facility	Basic Electrical Engineering Laboratory
Name of the equipment	Energy meter
Purpose	To measure the energy consumed in a single phase circuit using energy meter.
Scope	To obtain error between calculated energy and true energy
Responsibility	Faculty Incharge of the facility, HOD/EEE

STANDARD OPERATING PROCEDURE

- Connect the circuit as shown in the circuit diagram.
- Switch on the supply.
- Load is increased in steps and each time the meter readings are noted and also the time for one revolution is also noted down.
- Repeat the step 3 till the rated current is reached.
- Switch off the power supply.
- Calculate the necessary value from the given formula

PRECAUTIONS TO BE FOLLOWED

- Initially all switches kept at open condition and the lamp load should be no load condition.
- It is ensured that the meters are connected with proper polarities.

RECORD TO BE MAINTAINED

- Laboratory Manual containing the experiments that can be performed with the equipment
- Maintenance Record

HOD/EEE
Dr. L. Chitra

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AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY, PAIYANOOR

ELECTRONICS ENGINEERING LAB

STANDARD OPERATING PROCEDURE

Name of the Lab./facility	ELECTRONICS LAB
Purpose	To provide training for students, research scholars and industrial personnel, inresponse testing, frequency response characterization and in – circuit signal injection both experimental training set-up and real time parameters measurements.
Scope	In Electronics lab theoretical concepts of basic electronics presented in a laboratory environment and through practical hands-on experiments. Basic fundamentals of engineering practices covering International System of Units, engineering notation and prefixes definitions of current, voltage, resistance, power, work and efficiency are examined.
Responsibility	Faculty In-charge of the facility, HOD/ECE

STANDARD OPERATING PROCEDURE FOR CRO

- Switch on the oscilloscope to warm up (it takes a minute or two).
- Do not connect the input lead at this stage.
- Set the AC/GND/DC switch (by the Y INPUT) to DC.
- Set the SWP/X-Y switch to SWP (sweep).
- Set Trigger Level to AUTO.
- Set Trigger Source to INT (internal, the y input).
- Set the Y AMPLIFIER to 5V/cm (a moderate value).
- Set the TIMEBASE to 10ms/cm (a moderate speed).
- Turn the time base VARIABLE control to 1 or CAL.
- Adjust Y SHIFT (up/down) and X SHIFT (left/right) to give a trace across the middle of the screen, like the picture.
- Adjust INTENSITY (brightness) and FOCUS to give a bright, sharp trace.
- The oscilloscope is now ready to use.Experimental procedure to be followed as given in the manual.
- Upon completion of experiment the CROshall be turned off first, followed by turning off of mains power supply.

PRECAUTIONS TO BE FOLLOWED

- Short circuit of the battery terminals or any source terminals has to be avoided.
- Make all measurements in the centre area of the screen; even if the CRT is flat, there is a chance of reading errors caused by distortion.
- Use only shielded probes. Never allow your fingers to slip down to the metal probe tip when the probe is in contact with a hot circuit.
- Avoid operating an oscilloscope in a strong magnetic field. Such fields can causes distortion of the display. Most quality oscilloscopes are well shielded against magnetic interference. However, the face of the CRT is exposed and is subjected to magnetic interference.
- Most oscilloscopes and their probes have some maximum input voltage specified in the instruction manual. Do not exceed this maximum value. Also, do not exceed the maximum line voltage or use a different power

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TANDARD OPERATING PROCEDURE FOR FUNCTION GENERATOR

- Switch on the Function Generator to warm up (it takes a minute or two).
- Do not connect the input lead at this stage.
- After Power on the generator and select the desired output signal: square wave, sine wave or triangle wave.
- Connect the output leads to an oscilloscope to visualize the output signal and set its parameters using the amplitude and frequency controls.
- Attach the output leads of the function generator to the input of the circuit you wish to test.
- Attach the output of your circuit to a meter or oscilloscope to visualize the resulting change in signal.
- The Function Generator is now ready to use. Experimental procedure to be followed as given in the manual.
- Upon completion of experiment the FG shall be turned off first, followed by turning off of mains power supply.

PRECAUTIONS TO BE FOLLOWED

- Short circuit of the battery terminals or any source terminals has to be avoided.
- Do not use in high temperature and high pressure, humidity, strong vibration and strong magnetic fields and storage.
- Use in relatively stable environment, and provide good ventilation and cooling conditions.
- Use only shielded probes. Never allow your fingers to slip down to the metal probe tip when the probe is in contact with a hot circuit.
- Adjust the function generator output until the desired amplitude and frequency are achieved.
- Turn off the function generator and disconnect the scope probe.

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SEMICONDUCTOR DEVICES LAB

STANDARD OPERATING PROCEDURE

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Purpose	To provide training for students, research scholars and industrial personnel, in response testing, frequency response characterization and in – circuit signal injection both experimental training set-up and real time parameters measurements.
Scope	In Electronics lab theoretical concepts of basic electronics presented in a laboratory environment and through practical hands-on experiments. Basic fundamentals of engineering practices covering International System of Units, engineering notation and prefixes definitions of current, voltage, resistance, gain, power, work and efficiency are examined.
Responsibility	Faculty In-chargeof the facility, HOD/ECE

STANDARD OPERATING PROCEURE FOR POWER SUPPLY

- Turn on the DC power supply. Low-power DC supplies operate in two main modes - either voltage sources or current sources.
- Observe the voltage and current readings.
- Set the DC power supply output voltage to 10 V by adjusting the output voltage knob. Operating as a voltage source is the most common, where the supply provides low voltage DC; typically ranging between 0 and 36 V. In a current source operation, these supplies are "current limited" where their maximum current is set to the desired value, and their voltage is automatically adjusted to provide the desired maximum current. Current and voltage limits thus provide operational flexibility as well as safety margins when operating a DC power supply.
- Press the "Current" button to display the current limit and adjust the current knob to adjust the maximum current limit. Set the current limit of the supply.
- Note that most single-output DC power supplies have three terminals labeled as "+," "-," and ground. In many applications, "-" and ground are tied to provide a more stable and reduced noise environment when providing an external circuit with power. However, certain cases require that "-" is floating from ground to isolate the electrical circuit or apparatus under test from the supply ground.
- Upon completion of experiment the DC Power Supplies shall be turned off first, followed by turning off of mains power supply.

PRECAUTIONS TO BE FOLLOWED

- Short circuit of the battery terminals or any source terminals has to be avoided.
- Avoid shorting circuit the output of DC power supply.
- Set the voltage and current adjustment knobs as you desire. The unit should be stored in a dry and well ventilated place and the power cord removed if storing for long periods.
- Turn off the DC Power supply and disconnect the connection.

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ELECTRONICS LAB

STANDARD OPERATING PROCEDURE

Name of the Lab./facility	ELECTRONICS LAB
Purpose	To provide training for students, research scholars and industrial personnel, in implementing many application using logic gates. Using this digital trainer, the student is exposed to basic electronic theory of power supplies, regulation, ripple filtering, oscillators, multivibrator, rectifiers, diodes and transistor amplifiers. After this basic course, the student proceeds to an understanding of digital electronics.
Scope	The objective for this lab is to understand the fundamentals of logic gates and its use in implementing and testing basic Boolean functions. The student can implement digital logic concept in their projects.
Responsibility	Faculty In-charge of the facility, HOD/ECE

STANDARD OPERATING PROCEDURE FOR DIGITAL IC TRAINER KIT

- The connections should be given as per the experiment to be performed referring to the lab. Manual.
- Connections thus given shall be verified by the course instructor or lab in-charge
- To perform the experiment supply mains have to be switched on.
- Upon completion of experiment the Digital Trainer IC Kit shall be turned off first, followed by turning off of mains power supply.

PRECAUTIONS TO BE FOLLOWED

- Short circuit of the battery terminals or any source terminals has to be avoided.
- Avoid shorting circuit the output of DC power supply.
- Set the voltage and current adjustment knobs as you desire. The unit should be stored in a dry and well ventilated place and the power cord removed if storing for long periods.
- Turn off the DC Power supply and disconnect the connection after completion of experiment.

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Responsibility	Faculty In-chargeof the facility, HOD/ECE

TANDARD OPERATING PROCEDURE FOR DSO

- Switch on the oscilloscope to warm up (it takes a minute or two).
- Do not connect the input lead at this stage.
- Trig volt level at limit ： When turning the trigger knob, Alerts the user that the trigger level reached its limit.
- Horizon position at limitWhen turning the horizontal position knob , alerts user that the horizontal position reached its limit
- Volts/Div at limitAlerts the user that the vertical volt/Div knob was adjusted to the min (2mV/div) or maximum (5V/div) value
- Volts position at limitWhen turning the vertical position knob , alerts user that the vertical knob reached its limit.
- Sec/Div at limit：prompts the user that the Volts/Div is at full range while turning the vertical scale knob.
- Functionsisn't useable：Function not supported in this mode. (Example: Reference mode is not available in YX format)
- No signal!：The system could not detect a suitable signal (used in the auto set)
- Adjust at limit: You could adjust the pulse width with the ADJUST knob until the pulse width has reached the min of 20.0ns or max 10.0s limit.
- Adjust INTENSITY (brightness) and FOCUS to give a bright, sharp trace.
- The DSO is now ready to use. Experimental procedure to be followed as given in the manual.
- Upon completion of experiment the DSO shall be turned off first, followed by turning off of mains power supply.

PRECAUTIONS TO BE FOLLOWED

- Short circuit of the battery terminals or any source terminals has to be avoided.
- DO not store or leave the instrument where the LCD display will be exposed to direct sunlight for long periods of time.
- To avoid damage to the instrument or probes, do not expose them to sprays, liquids, or solvents.
- Use only shielded probes. Never allow your fingers to slip down to the metal probe tip when the probe is in contact with a hot circuit.
- DO not store or leave the instrument where the LCD display will be exposed to direct sunlight for long periods of time. CAUTION: To avoid damage to the instrument or probes, do not expose them to sprays, liquids, or solvents