SCHOOL OF ENGINEERING AND TECHNOLOGY
SRI PADMAVATHI MAHILA VISVAVIDYALAYAM
(WOMENS UNIVERSITY), TIRUPATI
DEPARTMENT OF ELECTRICAL AND ELECTONICS ENGINEERING

UG LABS

ELECTRICAL MACHINES LABORATORY

Purchase Order Number: ROC.No. SPMVV/SOET/EEE/2020 **Dated on:** 23-06-2020

Sl.No	Experiment Name	Equipment Stock Number	Equipment Description	Photograph	Quantity	Usage
1	**WORKSTATION-1**	SPMVV/SoET/EEE/EM-01	**DC SHUNT MOTOR WITH BRAKE DRUM ARRANGEMENT** 1. PowerRating : 3.7 kW/ 5 HP 2. Speed(rpm) : 1500 3. Type : ShuntExcited 4. Make : Benlec 5. ArmatureVoltage : 220 V 6. Fieldvoltage : 220 V 7. MaximumFieldCurrent : not More than1A		1	II & III B.TECH EEE, I B.TECH ECE, CSE, MEC
2	**WORKSTATION-2**	SPMVV/SoET/EEE/EM-02	**DC SHUNT MOTOR COUPLED TO THREE PHASE CYLINDRICAL ALTENATOR** **DC SHUNT MOTOR :** 1. PowerRating : 3.7 kW/ 5 HP 2. Speed(rpm) : 1500 3. Type : ShuntExcited 4. Make : Benlec 5. ArmatureVoltage : 220 V 6. Fieldvoltage : 220 V 7. MaximumFieldCurrent : not More than1A **THREE PHASE ALTERNATOR:** 1. Power Rating : 1.5 kVA, 0.8 pf Lag 2. Type : **CYLINDRICAL ROTOR** 3. Make : Benlec 4. Field excitation rings : 220 V, through slip 5. No. of poles : 4		1	II & III B.TECH EEE, I B.TECH ECE, CSE, MEC

			6. Speed(rpm) : 1500			
3	**WORKSTATION-3**	SPMVV/SoET/ EEE/EM -03	**DC SHUNT MOTOR COUPLED TO DC SHUNT GENERATOR** **DC SHUNT MOTOR:** 1. PowerRating : 3.7 kW/ 5 HP 2. Speed(rpm) : 1500 3. Type : ShuntExcited 4. Make : Benlec 5. ArmatureVoltage : 220 V 6. Fieldvoltage : 220 V 7. MaximumFieldCurrent : not More than1A **DC SHUNT GENERATOR:** 1. PowerRating : 3.7 kW/5 HP 2. Speed(rpm) : 1500 3. Type : ShuntExcited 4. Make : Benlec 5. ArmatureVoltage : 220V 6. Fieldvoltage : 220V 7. MaximumFieldCurrent : 1A		1	II & III B.TECH EEE, I B.TECH ECE, CSE, MEC
4.	**WORKSTATION-4**	SPMVV/SoET/ EEE/EM -04	**THREE PHASE SYNCHRONOUS MOTOR:** 1. Power Rating : 1.5 kVA, 0.8 pf Lag 2. Type : **SALIENT POLE ROTOR** 3. Rotor : Rotor to be provided with Damper Bars Start 4. Make : Benlec 5. Field excitation : 220 V, through slip rings		1	II & III B.TECH EEE, I B.TECH ECE, CSE, MEC
5.	**WORKSTATION-5**	SPMVV/SoET/ EEE/EM -05	**SINGLE PHASE TRANSFORMERS:** 1. Power Rating : 2 kVA 2. Type : SHELL type & Dry type. 3. Make : Benlec 4. Primary Voltage : 230±10%V, with tappings 50%& 100% of nominalvoltage 5. Secondary Voltage : 230±10%V, 50%: 86%: 100% of nominalvoltage		1	II & III B.TECH EEE, I B.TECH ECE, CSE, MEC

6.	**WORKSTATION-6**	SPMVV/SoET/ EEE/EM -06	**SCOTT CONNECTED TRANSFORMERS:** 1. Power Rating : 2 kVA 2. Type : SHELL type & Dry type. 3. Make : Benlec 4. Primary Voltage : 230±10%V, with tappings 50%& 100% of nominalvoltage 5. Secondary Voltage : 230±10%V, 50%: 86%: 100% of nominalvoltage			II & III B.TECH EEE, I B.TECH ECE, CSE, MEC
7.	**WORKSTATION-7**	SPMVV/SoET/ EEE/EM -07	**THREE PHASE SQUIRREL CAGE INDUCTION MOTOR WITH BRAKE DRUM:** 1. Power Rating : 3.7 kW/ 5 HP 2. Stator Voltage : 415V ±10% 3. Rotor : Squirrel cage, with skewed rotor bars 4. Make : Benlec		1	II & III B.TECH EEE, I B.TECH ECE, CSE, MEC
8.	**WORKSTATION-8**	SPMVV/SoET/ EEE/EM -08	**DC COMPOUND MOTOR COUPLED TO DC COMPOUND GENERATOR** **DC COMPOUND MOTOR:** 1. PowerRating : 3.7 kW/ 5 HP 2. Speed(rpm) : 1500 3. Type : CompoundExcited 4. Make : Benlec 5. ArmatureVoltage : 220 V 6. Fieldvoltage : 220 V 7. MaximumFieldCurrent : not More than1A **DC COMPOUND GENERATOR:** 1. PowerRating : 3.7 kW/5 HP 2. Speed(rpm) : 1500 3. Type : CompoundExcited 4. Make : Benlec 5. ArmatureVoltage : 220V 6. Fieldvoltage : 220V 7. MaximumFieldCurrent : 1A		1	II & III B.TECH EEE, I B.TECH ECE, CSE, MEC
9	**WORKSTATION-9**	SPMVV/SoET/ EEE/EM -09	**SINLE PHASE INDUCTION MOTOR WITH BRAKE DRUM ARRANGEMENT:** 1. Power Rating : 1.5 kW/ 2.0 HP 2. Stator Voltage : 230±10% V		1	II & III B.TECH EEE, I B.TECH ECE, CSE, MEC

			3. Current : 9.5 A 4. Speed(rpm) : 1440 5. Make : Benlec Rotor : Squirrel cage, with bar skewed rotor bars			
10	**WORKSTATION-10**	SPMVV/SoET/ EEE/EM -10	**DC SHUNT MOTOR WITH BRAKE DRUM ARRANGEMENT** 1. PowerRating : 3.7 kW/ 5 HP 2. Speed(rpm) : 1500 3. Type : ShuntExcited 4. Make : Benlec 5. ArmatureVoltage : 220 V 6. Fieldvoltage : 220 V 7. MaximumFieldCurrent : not More than1A		1	II & III B.TECH EEE, I B.TECH ECE, CSE, MEC
11	**WORKSTATION-11**	SPMVV/SoET/ EEE/EM -11	**DC SHUNT MOTOR COUPLED TO THREE PHASE SALIENT POLE ALTERNATOR** **DC SHUNT MOTOR:** 1. PowerRating : 3.7 kW/ 5 HP 2. Speed(rpm) : 1500 3. Type : ShuntExcited 4. Make : Benlec 5. ArmatureVoltage : 220 V 6. Fieldvoltage : 220 V 7. MaximumFieldCurrent : not More than1A **THREE PHASE ALTERNATOR:** 1. Power Rating : 1.5 kVA, 0.8 pf Lag 2. Type : **SALIENT ROTOR** 3. Make : Benlec 4. Field excitation : 220 V, through slip rings 5. No. of poles : 4 6. Speed(rpm) : 1500		1	II & III B.TECH EEE, I B.TECH ECE, CSE, MEC
12	**WORKSTATION-12**	SPMVV/SoET/ EEE/EM -12	**UNIVERSAL MOTOR WITH BRAKE DRUM ARRANGEMENT:** 1. PowerRating : 1kW 2. Make :Benlec 3. Speed(rpm) : 3000 4. Voltage : 230V		1	II & III B.TECH EEE, I B.TECH ECE, CSE, MEC

13	**WORKSTATION-13**	SPMVV/SoET/ EEE/EM -13	**THREE PHASE SQUIRREL CAGE INDUCTION MOTOR WITH BRAKE DRUM ARRANGEMENT** 1. Power Rating : 3.7 kW/ 5 HP 2. Stator Voltage : 415V ±10% 3. Rotor : Squirrel cage, with skewed rotor bars 4. Make : Benlec		1	II & III B.TECH EEE, I B.TECH ECE, CSE, MEC


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ELECTRICAL MACHINES LABORATORY


DC SHUNT MOTOR WITH BRAKE DRUM

ELECTRICAL MEASUREMENTS LABORATORY

Purchase Order No. :ROC.No.SPMVV/SOET/EEE/2020 Dated on: 23-06-2020

Sl.No	Equipment Name	Equipment Stock Number	Equipment Description	Photography	Quantity	Usage
1.	CROMPTONS DC POTENTIOMETER	SPMVV/SoET /EEE/EM/01	A Potentiometer is an instrument designed to measure an unknown voltage by comparing it with aknown voltage. The known voltage may be supplied by a standard cell or any other known voltage –reference source.		1	B.Tech III Year II Sem EEE
2.	ANDERSON'S BRIDGE	SPMVV/SoET /EEE/EM/02	AC bridges are often used to measure the value of unknown impedance (self/mutual inductance of inductors or capacitance of capacitors accurately). A large number of AC bridges are available and Anderson's Bridge is an AC bridge used to measure self-inductance of the coil. The bridge is balanced by a steady current by replacing the headphone H by moving coil galvanometer and A.C source by a battery. This is doneby adjusting the variable resistance, r. After a steady balance has been obtained, inductive balance is obtained by using the A.C source and headphone.		1	B.Tech III Year II Sem EEE
3.	SCHERING BRIDGE	SPMVV/SoET /EEE/EM/03	This bridge is used to measure to the capacitance of the capacitor, dissipation factor and measurement of relative permittivity.		1	B.Tech III Year II Sem EEE

4.	WHEAT STONE BRIDGE	SPMVV/SoET /EEE/EM/04	Wheatstone Bridge to measure unknown resistance values and as a means of calibrating measuring instruments, voltmeters, ammeters, etc, by the use of a long resistive slide wire. Although today digital multimeters provide the simplest way to measure a resistance. The Wheatstone Bridge can still be used to measure very low values of resistances down in the milli-Ohms range.		1	B.Tech III Year II Sem EEE
5.	TEMPERATURE USING RTD	SPMVV/SoET /EEE/EM/05	A platinum resistance temperature detector (RTD) is a device with a typical resistance of 100 Ω at 0 °C. It consists of a thin film of platinum on a plastic film. ... Passing current through an RTD generates a voltage across the RTD. By measuring this voltage, you can determine its resistance and, thus, its temperature.		1	B.Tech III Year II Sem EEE
6.	KELVIN DOUBLE BRIDGE	SPMVV/SoET /EEE/EM/06	The Kelvin double bridge is one of the best devices available for the precise measurement of low resistances. It is the modification of wheat stone bridge by which the errors due to contact resistance and lead resistances are eliminated. This bridge is named double bridge because it contains a second set of ratio arms. An interesting variation of the Wheatstone bridge is the Kelvin Double bridge, used for measuring very low resistances (typically less than 1/10 of an ohm)		1	B.Tech III Year II Sem EEE

7.	LVDT	SPMVV/SoET /EEE/EM/07	A linear variable differential transformer (LVDT) is an absolute measuring device that converts linear displacement into an electrical signal through the principle of mutual induction.		1	B.Tech III Year II Sem EEE
8.	STRAIN GUAGE	SPMVV/SoET /EEE/EM/08	A Strain gauge (sometimes refered to as a Strain gage) is a sensor whose resistance varies with applied force; It converts force, pressure, tension, weight, etc., into a change in electrical resistance which can then be measured.		1	B.Tech III Year II Sem EEE
9	ENERGY METER	SPMVV/SoET /EEE/EM/09	The meter which is used for measuring the energy utilises by the electric load is known as the energy meter. The energy is the total power consumed and utilised by the load at a particular interval of time. It is used in domestic and industrial AC circuit for measuring the power consumption.		1	B.Tech III Year II Sem EEE

10	CHOKE COIL BY THREE VOLTMETER & AMMETER METHOD	SPMVV/SoET /EEE/EM/10	The choke coil parameters we are going to measure in this 3-voltmeter & ammeter method are the inductance, resistance as all choke coils have inherent resistance in addition to their inductance. We also measure the quality factor and power absorbed by the given choke coil.		1	B.Tech III Year II Sem EEE
11	**Measurement of % ratio error and phase angle of given CT Testing by silsbees Method**	SPMVV/SoET /EEE/EM/11	silsbee's method is a comparison method used for Current Transformers testing.There are two types of Silsbee's methods; deflectional and null.Here the ratio and phase angle of the test transformer X are determined, in terms of that of a standard transformer S having the same nominal ratio.		1	B.Tech III Year II Sem EEE
12	**Calibration of LPF Wattmeter by Phantom Testing**	SPMVV/SoET /EEE/EM/12	low power factor wattmeters are calibrated using Phantom loading. The phantom loading is also called fictitious loading. When the current rating of a meter under test is high when tested with actual loading,then considerable wastage of power would occur. In order to avoid this phantom loading is used. Phantom loading consist of supply, the pressure circuit from a circuit of a required normal voltage and a current circuit from a low voltage supply. It is possible to circulate the rated current through the current circuit with a low voltage supply as the impedance of the circuit is very low. With this arrangement, the total power supplied for the test is that due to the small pressure coil current at normal voltage plus that due to the circuit current supplied at low voltage. The total power required for testing the meter is comparatively very small.		1	B.Tech III Year II Sem EEE


Electrical
Measurements lab


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POWER ELECTRONICS LABORATORY

Purchase Order No. :ROC.No.SPMVV/SOET/EEE/2020 Dated on: 23-06-2020

Sl.No	Equipment Name	Equipment Stock Number	Equipment Description	Photography	Quantity	Date of Installation	Usage
1	**Study of SCR, MOSFET, TRIAC, DIAC, IGBT Characteristics**	SPMVV/SoET/EEE/PE-01	A silicon controlled rectifier or semiconductor controlled rectifier is a four-layer solid-state current-controlling device. The principle of four-layer p–n–p–n switching was developed by Moll, Tanenbaum, Goldey and Holonyak of Bell Laboratories in 1956		1	23-06-2020	III B.TECH EEE
2	**Study of SCR gate firing circuits**	SPMVV/SoET/EEE/PE-02	This form of SCR triggering is the one that is most commonly seen in the different circuits used. It is simple, reliable, efficient and also easy to implement for most applications - a simple trigger signal can be applied, with suitable processing if required. This means that other electronic circuits can be used to derive a suitable trigger signal and this can then be applied to the SCR		1	23-06-2020	III B.TECH EEE
3	**Single phase AC voltage controller with R and RL loads**	SPMVV/SoET/EEE/PE-03	AC voltage controllers**are employed to vary the RMS value of the alternating voltage applied to a load circuit by introducing Thyristors between the load and a constant voltage ac source. The RMS value of alternating voltage applied to a load circuit is controlled by controlling the triggering angle of the Thyristors in the ac voltage controller circuits**		1	23-06-2020	III B.TECH EEE
4.	**Study of single phase Fully controlled bridge converters with R and RL Loads**	SPMVV/SoET/EEE/PE-04	single phase fully controlled converters are obtained by replacing the diodes of an uncontrolled converter with thyristors. It is one of the most popular converter circuits and is widely used in the speed control of separately excited dc machines. In a fully controlled converter the output voltage can be controlled by controlling the firing delay angle (α) of the thyristors.		1	23-06-2020	III B.TECH EEE

5.	**DC Jones Chopper with R & RL Loads and DC Motor Load**	SPMVV/SoET/EEE/PE-05	A chopper uses high speed to connect and disconnect from a source load. A fixed DC voltage is applied intermittently to the source load by continuously triggering the power switch ON/OFF. The period of time for which the power switch stays ON or OFF is referred to as the chopper's ON and OFF state times, respectively. Choppers are mostly applied in electric cars, conversion of wind and solar energy, and DC motors		1	23-06-2020	III B.TECH EEE
6.	**IGBT based Single Phase Bridge Inverter with R & RL load**	SPMVV/SoET/EEE/PE-06	The power circuit of a single phase full bridge inverter comprises of four thyristors T1 to T4, four diodes D1 to D1 and a two wire DC input power source V_s. Each diode is connected in antiparallel to the thyristors viz. D1 is connected in anti-parallel to T1 and so on			23-06-2020	III B.TECH EEE
7.	**Study of single phase Half controlled bridge converters with R and RL Loads**	SPMVV/SoET/EEE/PE-07	An AC/DC converter (rectifier) is the most typical power electronics device found in many consumer electronic devices, e.g. television sets, personal computers, battery chargers, etc. The power range is typically from tens of watts to several hundred watts. In industry a common application is the variable speed drive (VSD) that is used to control an induction motor. The power range of VSDs start from a few hundred watts and end at tens of megawatts.		1	23-06-2020	III B.TECH EEE
8.	**Single phase series inverter with R & RL loads**	SPMVV/SoET/EEE/PE-08	A power inverter, or inverter, is a power electronic device or circuitry that changes direct current (DC) to alternating current (AC). The resulting AC frequency obtained depends on the particular device employed. Inverters do the opposite of "converters" which were originally large electromechanical devices converting AC to DC.		1	23-06-2020	III B.TECH EEE
9	**Forced Commutations circuits Study Unit**	SPMVV/SoET/EEE/PE-09	A commutator is a rotary electrical switch in certain types of electric motors and electrical generators that periodically reverses the current direction between the rotor and the external circuit. It consists of a cylinder composed of multiple metal contact segments on the rotating armature of the machine. Two or more electrical contacts called "brushes" made of a soft		1	23-06-2020	III B.TECH EEE

			conductive material like carbon press against the commutator, making sliding contact with successive segments of the commutator as it rotates. The windings (coils of wire) on the armature are connected to the commutator segments.				
10	**Single phase parallel inverter with R & RL loads**	SPMVV/SoET/EEE/PE-10	A power inverter, or inverter, is a power electronic device or circuitry that changes direct current (DC) to alternating current (AC).[1] The resulting AC frequency obtained depends on the particular device employed. Inverters do the opposite of "converters" which were originally large electromechanical devices converting AC to DC.		1	23-06-2020	III B.TECH EEE


Power Electronics
&
Power Converters lab

CONTROL SYSTEMS LABORATORY

Purchase Order No. : ROC.No.SPMVV/SOET/EEE/2020 Dated on: 23-06-2020

Sl.No	Equipment Name	Equipment Stock Number	Equipment Description	Photography	Quantity	Date of Installation	Usage
1.	Temperature Controller using PID (microcontroller based)	SPMVV/SOET/EEE/CS/01	A solid state temperature sensor (LM-35) is used to convert the absolute temperature information to a proportional electrical signal. The controller unit compares the reference and the measured signals to generate the error controller option available to the user consists of ON-OFF or relay with two Hysterisis setting and combination of P,I,D and integral block having independent co-efficient settings.		1	04-12-2020	B.Tech III Year II Sem EEE
2.	Temperature Controller using PID (Analog)	SPMVV/SOET/EEE/CS/02	A temperature controller is a device used to hold a desired temperature at a specified value.Typical input sensors include thermocouples and resistive thermal devices (RTD's), and linear inputs such as mV and mA. Typical standardized thermocouple types include J, K, T, R, S, B and L types among others.		1	04-12-2020	B.Tech III Year II Sem EEE
3.	Effect of P, PI , PID Controller on a second order system.	SPMVV/SOET/EEE/CS/03	A proportional–integral–derivative controller (PID controller or three-term controller) is a control loopmechanism employing feedback that is widely used in industrial control systems and a variety of other applications requiring continuously modulated control. A PID controller continuously calculates an error value as the difference between a desired setpoint (SP) and a measured process variable (PV) and applies a correction based on proportional, integral, and derivative terms (denoted *P*, *I*, and *D* respectively),		1	04-12-2020	B.Tech III Year II Sem EEE

4.	Lead and Lag Compensation of Magnitude and Phase Plot	SPMVV/SoET/EEE/CS/04	Lead–lag compensators influence disciplines as varied as robotics, satellite control, automobile diagnostics, LCD displays and laser frequency stabilization. the control plant, desired specifications can be achieved using compensators. I, D, PI, PD, and PID, are optimizing controllers which are used to improve system parameters (such as reducing steady state error, reducing resonant peak, improving system response by reducing rise time). All these operations can be done by compensators as well, used in cascade compensation technique.		1	04-11-2020	B.Tech III Year II Sem EEE
5.	Transfer Function of DC Motor - DC Servo Motor Speed Torque	SPMVV/SoET/EEE/CS/05	Unit consists of D.C Servo motor whose characteristics is to be studied. A variable D.C supply is provided to vary the speed of the D.C Motor A pulley is fitted to the shaft of the D.C Servomotor for mechanical loading arrangement		1	04-12-2020	B.Tech III Year II Sem EEE
6.	Effect of Feedback on DC Servo Motor - DC Servomotor Speed Torque Charachtertics Closed Loop System	SPMVV/SoET/EEE/CS/06	An automatic device that uses error-sensing negative feedback to correct the action of a mechanism. On displacement-controlled applications, it usually includes a built-in encoder or other position feedback mechanism to ensure the output is achieving the desired effect.		1	21-12-2020	B.Tech III Year II Sem EEE
7.	Linear System Simulator (Time Response of Second order System)	SPMVV/SoET/EEE/CS/07	Op-amp simulated system for greater accuracy; Flexible systems configuration; Full details of experiments included ... Schematic diagram of the simulator shown includes transfer functions of the form 1/s and ... Closed loop step response ***of Second Order*** type-0 and type-1 systems		1		B.Tech III Year II Sem EEE

8.	Effect of Feedback on AC Servo Motor - Study Of AC Servo Position Control System (Closed Loop)	SPMVV/SoET/EEE/CS/08	Op-ampsimulated ***system*** for greater accuracy; Flexible ***systems*** configuration; Full ***details*** of experiments included ... Schematic diagram of the ***simulator*** shown includes transfer functions of the form 1/s and ... Closed loop step ***response of Second Order*** type-0 and type-1 ***systems***		1		B.Tech III Year II Sem EEE
9	Synchro Transmitter Receiver Pair	SPMVV/SoET/EEE/CS/09	Synchros are often used for measuring the angle of a rotating machine such as an antenna platform. In its general physical construction, it is much like an electric motor. The primary winding of the transformer, fixed to the rotor, is excited by an alternating current, which by electromagnetic induction, causes voltages to appear between the Y-connected secondary windings fixed at 120 degrees to each other on the stator. The voltages are measured and used to determine the angle of the rotor relative to the stator.		1		B.Tech III Year II Sem EEE


Control Systems lab


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