N. G. PATEL POLYTECHNIC

ELECTRICAL ENGINEERING DEPARTMENT

Subject: 3320903 – D.C.C. (2nd Semester)

SR. NO.	EXPERIMENT LIST
1	To Understand Various Electrical Symbols
2	Measure Voltage and Current in a given linear electrical circuit
3	Calculate Temperature Co-efficient of a given resistor
4	Connect Resistances in Series to get required effective resistance and verify
5	Connect Resistances in Parallel to get required effective resistance and verify
6	Connect Resistances in Parallel and series to get required effective resistance and verify
7	Measure current in a particular branch of the given electrical circuit using Kirchhoff's Current Law
8	Measure Voltage drop in a closed loop of the given electrical circuit using Kirchhoff's Voltage Law
9	Measure current in a particular branch of the given electrical circuit having two input sources using Superposition theorem
10	Verify Thevinin's theorem for a given circuit

Subject: 3330901 – A.C. CIRCUIT (3rd Semester)

SR. NO.	EXPERIMENT LIST
1	Use CRO to measure Peak value, RMS value, Period and Frequency of alternating quantity.

2	Measure of inductance and resistance of choke coil and also the active power through resistor
3	Measure voltage, current, power and power factor in a series RL circuit with relevant phasor diagram.
4	Measure voltage, current, power and power factor in a series RC circuit with relevant phasor diagram.
5	Measure voltage, current, power and power factor in a series RLC circuit with relevant phasor diagram.
6	Measure voltage, current, power and power factor in a RL parallel circuit with relevant phasor diagram.
7	Measure voltage, current, power and power factor in a RC parallel circuit with relevant phasor diagram.
8	Measure voltage, current, power and power factor in a RLC parallel circuit with relevant phasor diagram.
9	Measure voltage, current, power and power factor for combined series-parallel circuits
10	Test voltage and current relation for 3 phase star and delta connections.
11	Measure active and reactive power of three phase circuits.

Subject: 3330905 [E.C. &C.] – 3rd Semester

SR. NO.	EXPERIMENT LIST
1	To study characteristics of C.R.O. and measurement of voltage and frequency on C.R.O.
2	To Perform characteristic of PN junction diode.
3	To Perform Half wave, Full wave(with center tapped) & Bridge rectifier using CRO.
4	To study the characteristics of transistor connected in CE configuration.
5	To study the characteristics of Class B push-pull amplifier
6	To study principle and operation of Hartley oscillator.

7	To study principle and operation of colpitt's oscillator
8	To study & Identify the pins of IC 555 & IC 741.
9	To Perform characteristics of zener diode
10	To study use of IC'S 78XX and 79XX series as voltage regulator.
11	To study switched mode power supply.

Subject: 3330903 – Electrical Instrumentation (3rd Semester)

SR. NO.	EXPERIMENT LIST
1	Measurement of unknown emf by using potentiometer
2	Calibration of voltmeter and measure higher values d.c.voltage using potentiometer & volt ratio box.
3	Measurement of medium resistance using Wheatstone bridge method.
4	Measurement of low resistance by using Kelvin's double bridge.
5	Measurement of unknown inductance using Maxwell's l-c bridge.
6	To study of moving iron & moving coil type instrument.
7	Extend the range of ammeter using current transformer.
8	To perform test on single phase energy meter to determine error at different load and calibration of single phase energy meter.
9	Measurement of three phase power by two wattmeter method.
10	Measure linear displacement using LVDT.
11	Test the strain using strain gauge.

Subject: 3330904 – E.P.G. (3rd Semester)

SR. NO.	EXPERIMENT LIST
1	Interpret the line diagram of Thermal Power Station (T.P.S.) and main cycles & explain working of T. P. S.
2	Interpret the line diagram of Hydro Power Station (H.P.S.) and main cycles & explain working of H. P. S.
3	Interpret the line diagram of Nuclear Power Station (N.P.S.) and main cycles & explain working of N. P. S.
4	Prepare technical report of visit to a nearby H.P.S./Prepare a report on Hydro power stations in Gujarat by collecting data from Internet.
5	Collect the data from nearest power station for load curve preparation and interpret it.
6	Prepare technical report of visit to a nearby Solar PV station.
7	Prepare technical report of visit to a nearby Wind farm.
8	Visit the website of NTPC and prepare a report.
9	Visit the website of NHPC and prepare a report.
10	Draw and Interpret schematic diagram of a Diesel Power Station.
11	Visit the website of MNRE/GEDA and prepare a report.

Subject: 3330905– EC&C (3rd Semester)

SR. NO.	EXPERIMENT LIST
1	To study characteristics of C.R.O. and measurement of voltage and frequency on C.R.O.
2	To Perform characteristic of PN junction diode.
3	To Perform Half wave, Full wave(with center tapped) & Bridge rectifier using CRO.
4	To study the characteristics of transistor connected in CE configuration.
5	To study the characteristics of Class B push-pull amplifier
6	To study principle and operation of Hartley oscillator.
7	To study principle and operation of colpitt's oscillator
8	To study & Identify the pins of IC 555 & IC 741.
9	To Perform characteristics of zener diode
10	To study use of IC'S 78XX and 79XX series as voltage regulator.
11	To study switched mode power supply.

Subject: 3331905 - A.E.E.E. (3rd Semester)

SR. NO.	EXPERIMENT LIST
1	To Understand various Electrical symbols.
2	Measure voltage and current in a given linear electrical circuit. (Verification of Ohm's Law)
3	Demonstrate difference between AC and DC using CRO.
4	Measure current in the particular branch of the given circuit using KCL.
5	Measure voltage drop in a closed loop of the given circuit using KVL.
6	Measurement of voltage, current and power in single phase AC circuit.
7	To study of AC single phase electric motor.
8	To study DC electric motor.
9	To study earth tester and megger for the given installation.
10	To study and use of Fuse, MCB and ELCB.

(4th Semester)

Subject: 3340901 – Polyphone Transformer and AC Rotating Electrical Machines

SR. NO.	EXPERIMENT LIST
1	Identify various accessories of three phase transformer by visiting to nearby substation and draw its sketch with cooling arrangement.
2	Measure the slip of 3-phase Induction motor by using Tachometer and by Stroboscopic method.

3	Reverse the direction of rotation of a 3-phase IM.
4	Perform direct load test on three phase induction motor and draw performance curves
5	Perform no load and blocked rotor test on a three phase induction motor to obtain various parameters. Also construct circle diagram to determine its performance characteristics.
6	Make connections of DOL starter / star-delta starter / auto transformer / rotor rheostat starter for appropriate three phase induction motor.
7	Perform direct loading test on alternator to find out voltage regulation
8	Find out voltage regulation of alternator by ampere turn method for Unity, lagging and leading power factor.
9	Synchronize a given alternator with bus bar.
10	Construct V-curves of synchronous motor at different load conditions to see the effect of variation of excitation
11	Test the circuit of capacitor start capacitor run single phase induction motor used in a ceiling fan
12	Perform No load test on single phase induction motor to determine the friction and windage loss

(4th Semester)

Subject: 3340902 – Transmission & Distribution of Electrical Power

SR. NO.	EXPERIMENT LIST
1	Demonstrate cable jointing procedures of unarmored cables.
2	Demonstrate cable jointing procedures of armored cables.
3	Prepare a report on different type of insulators and bushings used in transmission system with their specifications.
4	Prepare a report about types of cables used in distribution system by visiting nearby cable suppliers/industries or otherwise with the help of internet.
5	Prepare Technical Report after visit to the Load Dispatch Centre.

6	Prepare a report on different type of Transmission Towers used in the industry.
7	Prepare a report after studying distribution system of a residential colony.
8	Prepare a report on substation with its layout after visiting a nearby substation.
9	Use crimping tools to fit lugs at cable ends of unarmored cables.
10	Use crimping tools to fit lugs at cable ends of armored cables.
11	Use earth testers.
12	Undertake pipe earthing.

(4th Semester)

Subject: 3340903 – Utilization of Electrical Energy

SR. NO.	EXPERIMENT LIST
1	To measure illumination at different places in college by Luxmeter.
2	Study the various lamps available in the market & collect the technical information.
3	Prepare a report of different luminaries available in the market & collect the technical data (Visit Local market / Use internet for data collection).
4	To study the different lighting accessories required for various types of lamps.
5	Prepare a report of specification of various heating furnaces used in industries.
6	Prepare a report of specification of various electrical welding machines available in college workshop.
7	To study of various traction systems.
8	To compare various Electric Drives for Traction.
9	Select the appropriate motors & justify selection for given different load situations.

10	To study speed time curves of traction system.
11	Prepare test reports & bill for servicing of electrical domestic appliances.

(4th Semester)

Subject: 3340904 – Digital Electronics & Digital Instruments

SR. NO.	EXPERIMENT LIST
1	To Study different types of Logic Gates & verify the truth-table for the same.
2	To Verify the Statements of Demorgan's Theorem.
3	To verify NAND gate as universal gate.
4	To verify NOR gate as universal gate.
5	To verify the given Boolean Expression experimentally by using Basic Logic Gates Boolean Expression: A.B+A'.C = (A + C). (A' + B)
6	To form Half-Adder & Full-Adder using logic gates and verify truth table.
7	To form Half Subtractor & Full Subtractor by logic gates and verify truth table
8	To perform 3 to 8 line decoder
9	To study different types of flip-flops.
10	To design and test 4-Bit Asynchronous Binary Counters.
11	To Study Digital to Analog and Analog to Digital converter.

(4th Semester)

Subject: 3340905 – CAED&S

SR. NO.	EXPERIMENT LIST
1	Draw electrical symbols and take print out with the help of computer.
2	Draw electronic symbols and take print out with the help of computer.
3	Draw following different types of rectifier circuit and take print out (a)Single phase half wave (b)Single phase full wave (c) Bridge rectifier.
4	Draw R-C couple amplifier circuit and take print out.
5	Simulate single phase half-wave rectifier circuit.
6	Simulate single phase full-wave rectifier circuit.
7	Prepare and test the performance of two-stage RC coupled amplifier circuit and take print out with help of computer.
8	Prepare and test the performance of RC differentiating circuit and take print out with the help computer.
9	Prepare and test the performance of RC integrating circuit and take print out with the help of computer.
10	DC series circuit solution.
11	Simulate R-L series circuit and observe voltage wave forms across each component.
12	Simulate R-L-C series circuit and observe voltage wave forms across each component.
13	Three Phase circuit solution.
14	Develop P.C.B. layout for a half wave rectifier circuit using software.
15	Develop P.C.B. layout for a half adder circuit using software.

(5th Semester)

Subject: 3350902 – EC&A

SR. NO.	EXPERIMENT LIST
1	Identify the energy management skills & strategies in the energy management system
2	Organize an energy management programme in a given industry.
3	List the various energy conservation methods useful in a particular industry.
4	Identify the critical areas where energy conservation is required.
5	List the various energy conservation methods useful in power generation, transmission & distribution.
6	Find out the payback period for given energy conservation equipments.
7	Determine depreciation cost of a given energy conservation project/equipment.
8	Identify various measuring instruments use for energy audit.
9	Prepare a technical report on ECBC.
10	Prepare an energy audit report.
11	Prepare a technical report on energy conservation act 2003.

(5th Semester)

Subject: 3350907 – ET&C

SR. NO.	NAME OF PRACTICAL
1.	Investigate the various traction systems in Indian railways.
2.	Investigate various latest trends in electric traction systems.
3.	Solve numerical on speed time curves.
4.	Solve numerical on specific energy consumption.
5.	Calculate energy saving by series parallel control of D. C. Motor (for two and four motors).
6.	Justify the use of D. C. Series motor as traction motor.
7.	Investigate the energy recovered using regenerative braking.
8.	Describe the train lighting system.
9.	Draw sketch of the current collecting equipment's.
10.	Study of layout of D. C. locomotive and diesel locomotive.
11.	Study of power diagram of A.C. locomotive and its equipment.

(5th Semester)

Subject: 3350901 – EWEC&C

SR. NO.	EXPERIMENT LIST
1.	Carryout following wirings a. Tube light wiring b. Stair case wiring c. Go down wiring d. Parallel loop wiring
2.	Select appropriate wiring and list materials and accessories for given project
3.	Prepare a tender notice for given project work
4.	Estimating and costing of a domestic installation cost (Residential building, laboratory room or Drawing hall etc).
5.	Estimating and costing of industrial installation. (work shop, agriculture, flour mill etc)
6.	Estimating and costing of overhead service connection. (Single phase and three phase).
7.	Estimating and costing of underground service connection (single phase and three phase).
8.	Estimation of material required for 220kv/110kv Transmission line.
9.	Estimation of material required for overhead, 440 V, 3-phase 4 wire or 3 wire distribution line.
10.	Estimating and costing of any one Electrical Product
11.	Estimating and costing of repairs and maintenance of any one domestic appliance

(5th Semester)

Subject: 3350904 – M&CSC

SR. NO.	EXPERIMENT LIST
1	Control angular displacement using Synchro.
2	Control and regulate speed of DC motor using tacho generator.
3	Develop assembly language program for arithmetic addition of two numbers using µP 8085 kit.
4	Develop assembly language program for arithmetic subtraction of two numbers using µP 8085 kit
5	Develop assembly language program for arithmetic multiplication of two numbers using µP 8085 kit
6	Interface programmable device like 8255 with µP 8085.
7	Interface switches and LEDs using µP 8085.
8	Control temperature using the 8085 application module.
9	Use µP 8085 for SCR firing control.
10	Control Traffic light using µP 8085.
11	Interface of seven segment LED display using 8051 kit.
12	Interface of LCD display using 8051 kit.
13	Control speed of stepper motor using 8051 kit.

SUBJECT: 3350903 – POWER ELECTRONICS

SR. NO.	EXPERIMENT LIST
1	To study the V-I characteristics of SCR. Determine the Break over voltage, Holding current and Latching current.
2	Determine efficiency, voltage ratio and ripple factor of three phases half wave rectifier.
3	To study the construction and working of IGBT, GTO and MCT.
4	To study the 1-phase AC voltage control using TRIAC. Observe the various waveforms.
5	Use R-C phase shift network for firing angle control of single phase controlled rectifier.
6	Design a simple Snubber circuit.
7	To study and test John's chopper circuit with lamp load.

8	To study and test Morgan's chopper circuit with lamp load.
9	Test IC TL494 for PWM.
10	To study and test the operation of parallel inverter using two SCR.
11	To perform speed control of DC motor using SCR-UJT Circuit.
12	To perform speed control of universal motor using TRIAC-DIAC circuit.

(6th Semester)

Subject: 3360901 – Switchgear & Protection

SR. NO.	EXPERIMENT LIST
1	Check the Polarity of Current Transformer and Potential Transformer and connect it with the relay.
2	Test thermal overload relay for protection of motor and set the relay properly
3	Test Buchholz relay for transformer protection
4	Determine the fusing factor of a given fusing material.
5	Test the performance of Vacuum circuit breaker.
6	Test the performance of SF6 circuit breaker.
7	Apply balance current protection scheme using appropriate switchgear.
8	Interpret various protective scheme used for transmission lines and feeders (from Blue print and visit).
9	Draw schematic diagram of protective schemes for 66 KV/ 132 KV/220 KV Substation nearby area. (after visit)
10	Interpret the protection scheme for an alternator in power station (From Blue print and visit).

11	Interpret different protective scheme for transformer.
12	Demonstrate the performance of a Horn gap lightning arrester.

(6th Semester)

Subject: 3360902 – Installation, Commissioning and Maintenance

SR. NO.	EXPERIMENT LIST
1	Prepare test reports of an electrical machine after commissioning.
2	Perform various tests on insulating oil.
3	Measure insulation resistance of a winding/cables/wiring installation
4	Prepare maintenance schedule for power transformer.
5	Prepare maintenance schedule for induction motor.
6	Troubleshoot a ceiling fan.
7	Dismantle and trouble shoot of fluorescent tube light.
8	Measure earth resistance of installation of building/domestic wiring and appliances by different methods.
9	Prepare plate/pipe earthing as per IS and measure the earth Resistance.
10	Interpret IE rules pertaining to safety.
11	Show the action to be taken when a person comes in contact with a live wire.

(6th Semester)

Subject: 3360907 – Maintenance of Transformer And Circuit Breaker

SR. NO.	EXPERIMENT LIST
1	Prepare a technical report on the preventive maintenance of transformer which supplies electrical power to your college.
2	Give comparison analysis between preventive and breakdown maintenance.
3	Perform various tests applied to insulating oil.
4	Prepare a technical report on various causes of troubles and failures of power transformer.
5	Prepare typical maintenance schedule for transformers up to 1000 KVA
6	Prepare typical maintenance schedule for transformers above 1000 KVA
7	Prepare a technical report on filtering process and filtering plant for transformer oil filtration.
8	Perform insulation resistance test of transformer.
9	Prepare detail specifications data sheet for different circuit breaker.(use name plate)
10	Prepare a technical report on various types of tests performed on high voltage ac circuit breakers.
11	Prepare a technical report on maintenance of air blast circuit breaker.
12	Prepare a technical report on maintenance of SF_6 circuit breaker.
13	Prepare a technical report on maintenance of Vacuum circuit breaker.

(6th Semester)

Subject: 3360908 – Electrification of Building Complexes

SR. NO.	EXPERIMENT LIST
1	Draw a complete wiring diagram, of any one of the commercial complexes. (Cinema, hotel, library, cultural hall, hospital etc.)
2	Interpret and prepare electrical test report of a large building or complex.
3	Calculate load, draw wiring diagram and estimate cost of any given high rise building.
4	Design Economical illumination system for any complex, building.
5	Testing of safety Devices in electrical installation in a high rise building.
6	Calculate Load for lift, escalators, air conditioning in high rise building.
7	Prepare field visit report (Important observations) of any high-rise building or Complex for electrical installation and wiring.
8	Perform electrical tests for commercial and high rise buildings as per IE.