LESSON PLAN FOR ACADEMIC SESSION: 2026-27(Winter)

Discipline: Electrical Engineering	Semester : 5th	Name of the Teaching Faculty: Er. Anita Shial
Subject: DIGITAL ELECTRONICS AND MICROPROCESSOR (TH-1)	No. of days/ week class allotted	Semester From :
Week	**Class Day**	**Theory Topics**
1ST	1st	**UNIT-I Digital Fundamentals** Number Systems – Decimal, Binary, Octal, Hexadecimal,
	2nd	1's and 2's complements
	3rd	Codes – Binary, BCD Excess 3, Gray, Alphanumeric codes
2ND	1st	Boolean theorems, Logic gates and truth tables, Universal gates
	2nd	Logic gates and truth tables, Universal gates
	3rd	Min terms Max terms
3RD	1st	Karnaugh map Minimization
	2nd	Quin McCluskey method of minimization.
	3rd	**UNIT-II Combinational & Synchronous Sequential Circuits** Design of Half and Full Adders
4TH	1st	Half and Full Subtractors
	2nd	Binary Parallel Adder -Multiplexer, Demultiplexer Decoders, and Priority Encoder
	3rd	Decoders, and Priority Encoder
5TH	1st	Flip flops – SR, JK, T, D Design of clocked sequential circuits
	2nd	Design of clocked sequential circuits Design of Counters-
	3rd	Design of Counters Shift registers
6TH	1st	Shift registers
	2nd	Universal Shift Register
	3rd	**UNIT-III Asynchronous Sequential Circuits And Memory Devices** Stable and Unstable states, output specifications
7TH	1st	cycles and races, state reduction, race free assignments, Hazards, Essential Hazards,
	2nd	Pulse mode sequential circuits, Design of Hazard free circuits
	3rd	Basic memory structure – ROM -PROM – EPROM – EEPROM –EAPROM,
8TH	1st	RAM – Static and dynamic RAM
	2nd	Programmable Logic Devices
	3rd	Programmable Logic Array (PLA)
9TH	1st	Programmable Array Logic (PAL)

	2nd	Field Programmable Gate Arrays (FPGA)
	3rd	**UNIT-IV 8085 Processor** Hardware Architecture
10TH	1st	pin diagram
	2nd	Functional Building Blocks of Processor
	3rd	Memory organization.
11TH	2nd	I/O ports
	3rd	data transfer concepts
12th	1st	Timing Diagram
	2nd	Interrupts.
	3rd	**UNIT-V Programming Processor** **Instruction**
13th	1st	Format modes
	2nd	addressing modes
	3rd	Assembly language format
14th	1st	Data transfer
	2nd	Programming:
	3rd	Loop structure with counting & Indexing
151h	1st	Look up table
	2nd	Look up table
	3rd	Subroutine instructions
161h	1st	Subroutine instructions
	2nd	stack -8255 architecture
	3rd	stack -8255 architecture
17th	1st	operating modes.
	2nd	Question discussion
	3rd	Question discussion

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Lecturer (S-II), Electrical
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SIGNATURE OF H.O.D/DEPT. IN CHARGE

Er. Sidharth Sankar Sahu
H.O.D. (Electrical)
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SIGNATURE OF ACADEMIC CO-ORDINATOR

Academic Coordinator
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LESSON PLAN FOR ACADEMIC SESSION: 2026-27(Winter)

Discipline: Electrical Engineering	Semester : 5th	Name of the Teaching Faculty: Er S S Sahu
Subject: INDUSTRIAL AUTOMATION & DRIVES EEPE301(a)	No. of days/ week class allotted	15 WEEKS
Week	Class Day	Theory Topics
1ST	1st	Introduction to Industrial Automation
	2nd	Automation: Need and benefits
	3rd	Types of automation system: Fixed, Programmable, Flexible
2ND	1st	Different systems used for Industrial automation: PLC, HMI, SCADA, DCS, Drives
	2nd	PLC Fundamentals • Building blocks of PLC: CPU, Memory organization, Input- output modules (discrete and analog),
	3rd	Specialty I/O Modules, Power supply
3RD	1st	Fixed and Modular PLC and their types, Redundancy in PLC module
	2Nd	I/O module selection criteria
	3rd	Interfacing different I/O devices with appropriate I/O modules
4TH	1st	PLC Programming and Applications
	2nd	PLC I/O addressing
	3rd	PLC programming Instructions: Relay type instructions, Timer instructions: On delay, off delay
5TH	1st	retentive, Counter instructions: Up, Down, High speed, Logical instructions, Comparison Instructions, Data handling Instructions, Arithmetic instructions
	2nd	PLC programming language: Functional Block Diagram (FBD)
	3rd	Instruction List. Structured text, Sequential Function Chart (SFC), Ladder Programming
6TH	1st	Simple Programming examples using ladder logic: Language based on relay, timer counter, logical, comparison, arithmetic and data handling instructions.
	2nd	PLC Based Applications: Motor sequence control, Traffic light control, Elevator control
	3rd	Tank Level control, Conveyor system
7TH	1st	Stepper motor control, Reactor Control Gate trigger circuits – Resistance and Resistance-Capacitance circuits.
	2nd	Electric Drives
	3rd	Fundamental Concept of Electric Drive
8TH	1st	Need of Electric Drives, Functional Block diagrams of an electric drives
	2nd	Types and Functions
	3rd	Four Quadrant Operation of Motor Drive
9TH	1st	Electric Braking

Discipline:	Semester : 5th	Name of the Teaching Faculty :

	2nd	Electric Braking of DC motor during lowering of loads and stopping, Regenerative braking, AC and DC rheostatic braking
	3rd	Selection of motor power rating
10TH	1st	DC Motor Drives
	2nd	Single phase and three phases controlled DC drives, Dual converter control of DC drives. Chopper controlled DC drives, Close loop control of DC drive
	3rd	Maintenance procedure.
11TH	1st	Induction Motor Drives
	2nd	Stator voltage control, V/f controlled induction motors, Slip power recovery, direct torque control
	3rd	Introduction to Synchronous Motor Drives
12th	1st	Applications o Speed control of AC motor /DC Motor.
	2nd	Applications o Speed control of AC motor /DC Motor.
	3rd	Supervisory Control and Data Acquisition System (SCADA), Introduction to SCADA
13th	1st	Typical SCADA architecture/block diagram, Benefits of SCADA
	2nd	Various editors of SCADA
	3rd	Interfacing SCADA system with PLC
14th	1st	Typical connection diagram
	2nd	Object Linking & embedding for Process Control (OPC) architecture
	3rd	Steps in Creating SCADA Screen for simple object
15th	1st	Steps for Linking SCADA object (defining Tags and Items) with PLC ladder program using OPC
	2nd	Applications of SCADA
	3rd	Traffic light control, water distribution, pipeline control

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LESSON PLAN FOR ACADEMIC SESSION: 2026-27(Winter)

Discipline: Electrical Engineering	Semester : 5th	Name of the Teaching Faculty: Ashirbad behera
Subject: Switchgear & Protection EEPE303(a)	No. of days/ week class allotted	15 WEEKS
Week	Class Day	Theory Topics
1ST	1st	Basics of Protection,
	2nd	Necessity, functions of protective system
	3rd	Normal and abnormal conditions.
2ND	1st	Types of faults and their causes.
	2nd	Protection zones and backup protection
	3rd	Short circuit fault calculations in lines fed by generators through transformers
3RD	1st	Need of current limiting reactors and their arrangements.
	2nd	Isolators- Vertical break, Horizontal break and Pantograph type.
	3rd	HRC fuses – Construction, working, characteristics and applications.
4TH	1st	Arc formation process, methods of arc extinction (High resistance and Low resistance)
	2nd	Arc voltage, Recovery voltage, Re-striking voltage, RRRV
	3rd	HT circuit breakers (Sulphur-hexa Fluoride (SF6), Vacuum circuit breaker) - Working, construction, specifications and applications.
5TH	1st	L.T. circuit breaker (Air circuit breakers (ACB)
	2nd	Miniature circuit breakers (MCB)
	3rd	Moulded case circuit breakers (MCCB)
6TH	1st	Earth leakage circuit breaker (ELCB)) - Working and applications
	2nd	Selection of LT and HT circuit breakers (ratings),
	3rd	Selection of MCCB for motors
7TH	1st	Gas insulated switchgear.
	2nd	Protective Relays • Fundamental quality requirements: Selectivity, Speed, Sensitivity, Reliability, Simplicity, Economy.
	3rd	Basic relay terminology- Protective relay, Relay time, Pick up, Reset current, current setting, Plug setting multiplier, Time setting multiplier.
8TH	1st	Protective relays: Classification, principle of working, construction and operation of – Electromagnetic (Attracted armature type, Solenoid type, Watt-hour meter type) relay,
	2nd	Thermal relay. Block diagram and working of Static relay.
	3rd	Overcurrent relay-Time current characteristics.
9TH	1st	Microprocessor based over current relays: Block diagram, working.

	2nd	Distance relaying- Principle, operation of Definite distance relays.
	3rd	Directional relay: Need and operation.
10TH	1st	Operation of current and voltage differential relay.
	2nd	Operation of current and voltage differential relay.
	3rd	Protection of Alternator and Transformer
11TH	1st	Alternator Protection Faults, Differential protection Over current
	2nd	earth fault, overheating and field failure, protection.
	3rd	Reverse power protection.
12th	1st	Transformer Protection Faults
	2nd	Differential, over current, earth fault
	3rd	over heating protection, Limitations of differential protection
13th	1st	Buchholz relay: Construction, operation, merits and demerits.
	2nd	Revision
	3rd	Protection of Motors
14th	1st	Bus-bar and Transmission Line Motor Faults. Short circuit protection
	2nd	Overload protection, Single phase preventer, Bus bar and Transmission line
	3rd	Faults on Bus bar and Transmission Lines
15th	1st	Bus bar protection: Differential and Fault bus protection
	2nd	Transmission line: Over current, Distance and Pilot wire protection.
	3rd	PYQ Discussion

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LESSON PLAN FOR ACADEMIC SESSION: 2026-27(Winter)

Discipline: Electrical Engineering	Semester : 5th	Name of the Teaching Faculty: Er. Anita Shial
Subject: DIGITAL ELECTRONICS AND MICROPROCESSOR LABORATORY(PR:1)	No. of days/ week class allotted	Semester From :

Week	Class Day	Topics
1ST	1st	Verification of the truth tables of TTL gates.
	2nd	Verification of the truth tables of TTL gates.
	3rd	Verification of the truth tables of TTL gates.
2ND	1st	Verify the NAND and NOR gates as universal logic gates.
	2nd	Verify the NAND and NOR gates as universal logic gates.
	3rd	Verify the NAND and NOR gates as universal logic gates.
3RD	1st	Design and verification of the truth tables of Half and Full adder circuits.
	2nd	Design and verification of the truth tables of Half and Full adder circuits.
	3rd	Design and verification of the truth tables of Half and Full adder circuits.
4TH	1st	Design and verification of the truth tables of Half and Full subtractor circuits
	2nd	Design and verification of the truth tables of Half and Full subtractor circuits
	3rd	Design and verification of the truth tables of Half and Full subtractor circuits
5TH	1st	Verification of the truth table of the Multiplexer 74150.
	2nd	Verification of the truth table of the Multiplexer 74150.
	3rd	Verification of the truth table of the Multiplexer 74150.
6TH	1st	Verification of the truth table of the De-Multiplexer 74154.
	2nd	Verification of the truth table of the De-Multiplexer 74154.
	3rd	Verification of the truth table of the De-Multiplexer 74154.
7TH	1st	Design and test of an S-R flip-flop using NOR/NAND gates.
	2nd	Design and test of an S-R flip-flop using NOR/NAND gates.
	3rd	Design and test of an S-R flip-flop using NOR/NAND gates.
8TH	1st	Verify the truth table of a J-K flip-flop (7476)
	2nd	Verify the truth table of a J-K flip-flop (7476)
	3rd	Verify the truth table of a J-K flip-flop (7476)
9TH	1st	Verify the truth table of a D flip-flop (7474)

	2nd	Verify the truth table of a D flip-flop (7474)
	3rd	Verify the truth table of a D flip-flop (7474)
10TH	1st	Operate the counters 7490, 7493
	2nd	Operate the counters 7490, 7493
	3rd	Operate the counters 7490, 7493
11TH	1st	Design of 4-bit shift register (shift right).
	2nd	Design of 4-bit shift register (shift right).
	3rd	Design of 4-bit shift register (shift right).
12TH	1st	Design of modulo-4 counter using J K flip-flop.
	2nd	Design of modulo-4 counter using J K flip-flop.
	3rd	Design of modulo-4 counter using J K flip-flop.
13TH	1st	Write a program using 8085 Microprocessor for addition of two BCD numbers
	2nd	Write a program using 8085 Microprocessor for addition of two BCD numbers
	3rd	Write a program using 8085 Microprocessor for addition of two BCD numbers
14TH	1st	Write a program using 8085 Microprocessor for subtraction of two BCD numbers
	2nd	Write a program using 8085 Microprocessor for subtraction of two BCD numbers
	3rd	Write a program using 8085 Microprocessor for subtraction of two BCD numbers
151H	1st	Perform division of two 8 bit numbers using 8085
	2nd	Perform division of two 8 bit numbers using 8085
	3rd	Perform division of two 8 bit numbers using 8085
161H	1st	Perform multiplication of two 8 bit numbers using 8085
	2nd	Perform multiplication of two 8 bit numbers using 8085
	3rd	Perform multiplication of two 8 bit numbers using 8085
17TH	1st	Write a program to arrange an array of data in ascending order.
	2nd	Write a program to arrange an array of data in ascending order
	3rd	Write a program to arrange an array of data

		in ascending order.
18TH	1ST	Write a program to arrange an array of data in descending order.
	2ND	Write a program to arrange an array of data in descending order.
	3RD	Write a program to arrange an array of data in descending order.
19TH	1ST	Convert given Hexadecimal number into its equivalent ASCII number and vice versa using 8085 instruction set.
	2ND	Convert given Hexadecimal number into its equivalent ASCII number and vice versa using 8085 instruction set.
	3RD	Convert given Hexadecimal number into its equivalent ASCII number and vice versa using 8085 instruction set.
20TH	1ST	Write 8085 Interfacing Program A/D Interfacing.
	2ND	Write 8085 Interfacing Program D/A Interfacing
	3RD	Write 8085 Interfacing Program I/O port Communication using 8255

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Academic Coordinator
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Berhampur

Lesson plan: Energy Conservation & Ausit Laboratory(PR2)
Prepared by: Ashirbad Behera
Semester:5th sem (Winter 2026)

Weeks	Topics
Week1	Identify star labelled electrical apparatus and compare the data for various star ratings.
Week2	Determine the '% loading' of the given loaded Induction motor
Week3	Determine the reduction in power consumption in star mode operation of Induction motor compared to delta mode
Week4	Use APFC unit for improvement of p. f. of electrical load
Week5	Compare power consumption of different types of TL with choke, electronic ballast and LED lamps by direct measurements
Week6	Determine the reduction in power consumption by replacement of lamps in a classroom / laboratory
Week7	Determine the reduction in power consumption by replacement of Fans and regulators in a classroom / laboratory
Week8	Collect electricity bill of an industrial consumer and suggest suitable tariff for energy conservation and its impact on energy bill
Week9	Collect electricity bill of a commercial consumer and suggest suitable tariff for conservation and reduction of its energy bill
Week10	Collect electricity bill of a residential consumer and suggest suitable means for conservation and reduction of the energy bill.
Week11	Collect electricity bill of a residential consumer and suggest suitable means for conservation and reduction of the energy bill. Estimate energy saving by improving power factor and load factor for given cases
Week12	Prepare a sample energy audit questionnaire for the given industrial facility
Week13	Prepare an energy audit report (Phase-I)
Week14	Prepare an energy audit report (Phase-II)
Week15	Prepare an energy audit report (Phase-III)

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LESSON PLAN FOR ACADEMIC SESSION-2026-27(Winter)

Discipline- Electrical Engg.	Semester-5th	Name of the teaching faculty- Er.ANITA SHIAL	Mode of Teaching
Subject- (PR:2)ELECTRICAL CIRCUITS LABORATORY	No of days/week class allotted-4	Semester from :- No of weeks-15	
Week	Class day	THEORY	
1st	1ST	Use voltmeter, ammeter, wattmeter to determine active, reactive and apparent power consumed in given R-L-C series circuit. Draw phasor diagram	
	2ND		
	3RD	Use voltmeter, ammeter, wattmeter to determine active, reactive and apparent power consumed in given R-L-C series circuit. Draw phasor diagram	
	4TH		
2nd	1ST	Use variable frequency supply to create resonance in given series R-L-C circuit or by using variable inductor or variable capacitor.	
	2ND		
	3RD	Use variable frequency supply to create resonance in given series R-L-C circuit or by using variable inductor or variable capacitor.	
	4TH		
3rd	1ST	Use voltmeter, ammeter, wattmeter, p.f meter to determine current, p.f., active,reactive and apparent power for given R-L-C parallel circuit with series connection of resistor and inductor in parallel with capacitor.	
	2ND		
	3RD	Use voltmeter, ammeter, wattmeter, p.f meter to determine current, p.f., active,reactive and apparent power for given R-L-C parallel circuit with series connection of resistor and inductor in parallel with capacitor.	
	4TH		
4th	1ST	Use variable frequency supply create resonance in given parallel R-L-C circuit or by using variable inductor or capacitor	
	2ND		
	3RD	Use variable frequency supply create resonance in given parallel R-L-C circuit or by using variable inductor or capacitor	
	4TH		
5th	1ST	Use voltmeter, ammeter, wattmeter, p.f meter to determine line and phase quantities of voltage and current for balanced three phase star and delta connected load and calculate active, reactive, and apparent power. Draw phasor diagram.	
	2ND		
	3RD	Use voltmeter, ammeter, wattmeter, p.f meter to determine line and phase quantities of voltage and current for balanced three phase star and delta connected load and calculate active, reactive, and apparent power. Draw phasor diagram.	
	4TH		
6th	1ST	Use voltmeter, ammeter to determine current through the given branch of an electric network by applying mesh analysis	
	2ND		
	3RD	Use voltmeter, ammeter to determine current through the given branch of an electric network by applying mesh analysis	
	4TH		
7th	1ST	Use voltmeter, ammeter to determine current through the given branch of an electric network by applying node analysis	
	2ND		
	3RD	Use voltmeter, ammeter to determine current through the given branch of an electric network by applying node analysis	
	4TH		
8th	1ST	Use voltmeter, ammeter to determine current through the given branch and voltage across the given element of circuit by applying superposition theorem	
	2ND		
	3RD	Use voltmeter, ammeter to determine current through the given branch and voltage across the given element of circuit by applying superposition theorem	
	4TH		
9th	1ST	Use voltmeter, ammeter to determine equivalent circuit parameter in a given circuit by applying Thevenin's theorem	
	2ND		
	3RD	Use voltmeter, ammeter to determine equivalent circuit parameter in a given circuit by applying Norton's theorem	
	4TH		
10th	1ST	Use voltmeter, ammeter to determine load resistance for maximum power transfer for a given circuit by applying maximum power transfer theorem.	
	2ND		
	3RD	Use voltmeter, ammeter to determine load resistance for maximum power transfer for a given circuit by applying maximum power transfer theorem.	
	4TH		
11th	1ST	Use the node-voltage method to solve a circuit that containing resistors and independent and dependent current sources and	
	2ND		

LESSON PLAN FOR ACADEMIC SESSION-2026-27(Winter)

		voltage sources is connected between non-reference nodes using Simulink Sims cape	
	3RD	Use the node-voltage method to solve a circuit that containing resistors and independent and dependent current sources and voltage sources is connected between non-reference nodes using Simulink Sims cape	
	4TH		
12th	1ST	Use the mesh-current method to solve a circuit for an arbitrary network containing resistors and independent and dependent voltage and current sources using Simulink Sims cape	
	2ND		
	3RD	Use the mesh-current method to solve a circuit for an arbitrary network containing resistors and independent and dependent voltage and current sources using Simulink Sims cape	
	4TH		
13th	1ST	Using Simulink, determine A.C voltage and current response in given R, L, C circuit.	
	2ND		
	3RD	Using Simulink, determine A.C voltage and current response in given R, L, C circuit.	
	4TH		
14th	1ST	Using Simulink, create resonance in given series R-L-C circuit	
	2ND		
	3RD	Using Simulink, create resonance in given series R-L-C circuit	
	4TH		
15th	1ST	Verify network theorems(Superposition, Thevenin's, Norton's, Maximum power transfer) using Simulink Simscape	
	2ND		
	3RD	Verify network theorems(Superposition, Thevenin's, Norton's, Maximum power transfer) using Simulink Simscape	
	4TH		

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LESSON PLAN FOR ACADEMIC SESSION: 2026-27(Winter)

Discipline: Electrical Engineering	Semester : 5th	Name of the Teaching Faculty: Er. Anita Shial
Subject: INDUSTRIAL AUTOMATION & DRIVES LABORATORYPR:PR3(a)	No. of days/ week class allotted	Semester From :
Week	**Class Day**	**Theory Topics**
1ST	1st	Identify various automation systems available in different appliances/ devices/ machines in industry
	2nd	Identify various automation systems available in different appliances/ devices/ machines in industry
	3rd	Identify various automation systems available in different appliances/ devices/ machines in industry
2ND	1st	Identify various parts of the given PLC and front panel status indicators.
	2nd	Identify various parts of the given PLC and front panel status indicators.
	3rd	Identify various parts of the given PLC and front panel status indicators.
3RD	1st	Use PLC to test the START STOP logic using two inputs and one output. 3 4. Develop/Execute a ladder program for the given application using following: - timer, counter, comparison, logical, arithmetic instructions
	2nd	Use PLC to test the START STOP logic using two inputs and one output. 3 4. Develop/Execute a ladder program for the given application using following: - timer, counter, comparison, logical, arithmetic instructions
	3rd	Use PLC to test the START STOP logic using two inputs and one output. 3 4. Develop/Execute a ladder program for the given application using following: - timer, counter, comparison, logical, arithmetic instructions
4TH	1st	Use PLC to control the following devices like lamp, motor, push button switches, proximity
	2nd	Use PLC to control the following devices like lamp, motor, push button switches, proximity
	3rd	Use PLC to control the following devices like lamp, motor, push button switches, proximity
5TH	1st	Develop / test the Ladder program for sequential control application of lamps/ DC motors.
	2nd	Develop / test the Ladder program for sequential control application of lamps/ DC motors.
	3rd	Develop / test the Ladder program for sequential control application of lamps/ DC motors.
6TH	1st	Develop ladder program for Traffic light control system.
	2nd	Develop ladder program for Traffic light control system.
	3rd	Develop ladder program for Traffic light control system.
7TH	1st	Develop and test ladder program for pulse counting using limit switch /Proximity sensor.
	2nd	Develop and test ladder program for pulse counting using limit switch /Proximity sensor.
	3rd	Develop and test ladder program for pulse counting using limit switch /Proximity sensor.
8TH	1st	Develop /test ladder program for Automated car parking system.
	2nd	Develop /test ladder program for Automated car parking system.
	3rd	Develop /test ladder program for Automated car parking system.
9TH	1st	Develop / test ladder program for rotating stepper motor in forward and reverse direction at constant speed.

	2nd	Develop / test ladder program for rotating stepper motor in forward and reverse direction at constant speed.
	3rd	Develop / test ladder program for rotating stepper motor in forward and reverse direction at constant speed.
10TH	1st	Develop /test ladder program for tank water level control.
	2nd	Develop /test ladder program for tank water level control.
	3rd	Develop /test ladder program for tank water level control.
11TH	1st	Develop / test ladder program for control of speed of stepper motor with suitable drivers
	2nd	Develop / test ladder program for control of speed of stepper motor with suitable drivers
	3rd	Develop / test ladder program for control of speed of stepper motor with suitable drivers
12th	1st	Dismantle the given DC motor / AC motor to identify its different parts
	2nd	Dismantle the given DC motor / AC motor to identify its different parts
	3rd	Dismantle the given DC motor / AC motor to identify its different parts
13th	1st	Control the speed of DC Motor using armature voltage control / field current control method
	2nd	Control the speed of DC Motor using armature voltage control / field current control method
	3rd	Control the speed of DC Motor using armature voltage control / field current control method
14th	1st	Control the speed of three phase squirrel cage induction motor using stator voltage control
	2nd	Control the speed of three phase squirrel cage induction motor using stator voltage control
	3rd	Control the speed of three phase squirrel cage induction motor using stator voltage control
151h	1st	Control the speed of three phase squirrel cage induction motor using stator voltage control
	2nd	Control the speed of three phase squirrel cage induction motor using stator voltage control
	3rd	Control the speed of three phase squirrel cage induction motor using stator voltage control
161h	1st	Observe the effect on speed of given D.C. series motor / D.C. separately excited motor by varying armature voltage using step down chopper.
	2nd	Observe the effect on speed of given D.C. series motor / D.C. separately excited motor by varying armature voltage using step down chopper.
	3rd	Observe the effect on speed of given D.C. series motor / D.C. separately excited motor by varying armature voltage using step down chopper.
17th	1st	Observe the effect on speed of given D.C. series motor / D.C. separately excited motor by varying armature voltage using step down chopper.
	2nd	Observe the effect on speed of given D.C. series motor / D.C. separately excited motor by varying armature voltage using step down chopper.
	3rd	Observe the effect on speed of given D.C. series motor / D.C. separately excited motor by varying armature voltage using step down

		chopper.
	1st	Control the speed of the given separately excited motor by changing the firing angle of SCR using single-phase semi converter and measure the speed.
	2nd	Control the speed of the given separately excited motor by changing the firing angle of SCR using single-phase semi converter and measure the speed.
	3rd	Control the speed of the given separately excited motor by changing the firing angle of SCR using single-phase semi converter and measure the speed.
	1st	Control the speed of the given separately excited motor by changing the firing angle of SCR using single-phase full converter and measure the speed.
	2nd	Control the speed of the given separately excited motor by changing the firing angle of SCR using single-phase full converter and measure the speed.
	3rd	Control the speed of the given separately excited motor by changing the firing angle of SCR using single-phase full converter and measure the speed.
	1st	Control the speed of the given three-phase induction motor by using constant V/f method / by varying frequency and plot the graph between speed and frequency.
	2nd	Control the speed of the given three-phase induction motor by using constant V/f method / by varying frequency and plot the graph between speed and frequency.
	3rd	Control the speed of the given three-phase induction motor by using constant V/f method / by varying frequency and plot the graph between speed and frequency.

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