Second Year (Advanced Diploma in Electrical Technology)						
Semester	**Paper Code**	**Title of the Paper**	**Credits**			**Marks**
			Total	**Theory**	**Practical**	
III	BVET31	Computer Technology	4	4	-	100
	BVET32	Electrical Appliances-II	4	4	-	100
	BVET33	Electrical Machines-II	4	4	-	100
	BVET34	Lab Practical-1 (Based on BVET31)	6	-	6	150
	BVET35	Lab Practical-2 (Based on BVET32)	6	-	6	150
	BVET36	Lab Practical-3 (Based on BVET33)	6	-	6	150
		Total Credits	**30**	**12**	**18**	**750**
Semester	**Paper Code**	**Title**	**Credits**			**Marks**
			Total	**Theory**	**Practical**	
IV	BVET40	Environment Awareness	Grade			
	BVET41	Entrepreneurship and Employable Skill	4	4	-	100
	BVET42	Basic Electronics	4	4	-	100
	BVET43	Electrical Measurement & Instrumentation	4	4	-	100
	BVET44	Lab Practical-1 (Based on BVET42)	6	-	6	150
	BVET45	Lab Practical-2 (Based on BVET43)	6	-	6	150
	BVET46	Lab Practical-3 (Based on Motor Pump and starters)	6	-	6	150
		Total Credits	**30**	**12**	**18**	**750**

Advanced Diploma in Electrical Technology

Second Year: Semester –I

Paper Code: BVET31 Title: Computer Technology Credits: 4

Units	Name of Unit	Content
I	Basic Concepts of Computer	Introduction, Characteristics of Computers, Block Diagram Of Computer, Input / Output Devices, Computer Software
II	Mother board components and their function	Types, I/O ports, BIOS, power supply, Slots: Memory slots, expansion slots, Back panel, connectors: power, IDE, Memory and processor, CMOS battery.
III	Storage devices	Primary and Auxiliary - types, functions, applications and their specifications
IV	Computer Languages	Classification of Language**,** Compiler & Interpreter, Open Source Software
V	Operating System	Introduction to Operating System, Start Menu, Task Bar, Start A Program, Quit A Program, File Management In Windows
VI	Networking	Data Communication, types, Protocols, Cables, Maintenance and trouble shooting

Advanced Diploma in Electrical Technology

Second Year: Semester –I

Paper Code: BVET32 Title: Electrical Appliances-II Credits: 4

Units	Name of Unit	Content
I	Testing Equipments & Basic control equipments	MCB (Miniature Circuit Breaker), ELCB (Earth Leakage Circuit Breaker) bimetallic relay, thermocouple, overload switch, electromagnetic relay,
II	Tube Light	Principle, working, various parts and their use, types, specification, maintenance and trouble shooting
III	Water Heater & Geyser	Principle, working, various parts and their use, types, specification, maintenance and trouble shooting
IV	Hair dryer	Principle, working, various parts and their use, types, specification, maintenance and trouble shooting
V	Fan Regulator	Principle, working, various parts and their use, types, specification, maintenance and trouble shooting
VI	Table lamp & Torch	Principle, working, various parts and their use, types, specification, maintenance and trouble shooting Principle, working, various parts and their use, types, specification, maintenance and trouble shooting
VII	Electric door bell	Principle, working, various parts and their use, types, Specification, maintenance and trouble shooting

Advanced Diploma in Electrical Technology

Second Year: Semester –I

Paper Code: BVET33 Title: Electrical Machines-II Credits: 4

Units	Name of Unit	Content
I	3 Phase Transformer	Introduction, Construction, Working principle, Standard connections of three phase transformers and their suitability for various applications, Descriptive treatment of Parallel operation of three phase transformers Scott connection and V-connections. Three winding (tertiary windings) transformers. Autotransformers, their ratings and applications.
II	3Phase Induction Motor	Construction: Stator, Squirrel cage & wound rotors. Principle of working, simplified theory with constant air gap flux; slip, frequency of rotor emf and rotor currents, Production of torque, torque-slip relation, condition for maximum torque, torque-slip Characteristics, effect of rotor resistance on torque-slip characteristics Losses in three phase induction motor, power-flow diagram.
III	Synchronous Motor	Introduction to synchronous – induction motor. Principle of operation. Methods of starting. Equivalent circuit, significance of torque angle, Losses, efficiency and Power flow chart. Operation of 3-phase Synchronous motor with constant excitation and variable load, Phenomenon of hunting and its remedies. Applications of 3- phase synchronous motors. Comparison of 3 phase synchronous motor with 3-phase induction motor
IV	Synchronous Generator	a) Cylindrical rotor type: Principle of operation. Emf equation and winding factors, rating of generator. Generator on no-load and on balanced load. b) Salient pole type: Armature reaction as per Blondel's two reaction theory for salient-pole machines,
V	Speed Control of Electric Motor	Study different types of speed control methods for electrical motors

Advanced Diploma in Electrical Technology

Second Year: Semester –I

Paper Code: BVET34 Title: Lab Practical-1 (Based on BVET31) Credits: 6

Sr.No	Name of Practical
1	Study of various parts of Computer & their connections
2	Study of Mother Board
3	Study of Various Storage Devices
4	Study of Keyboard, Mouse and Monitor
5	Study of Printers and their installation
6	Installation of operating system and software
7	Antivirus Software use and its maintenance
8	Troubleshooting of Computer
9	Study and Application of MS Word
10	Study and Application of MS Excel / Power Point
11	Networking of Computers
12	Visit to Computer Shop and Market Survey

Advanced Diploma in Electrical Technology

Second Year: Semester –I

Paper Code: BVET35 Title: Lab Practical-2 (Based on BVET32) Credits: 6

Sr.No	Name of Practical
1	Use of Line tester, MCB (Miniature Circuit Breaker), ELCB (Earth Leakage Circuit Breaker)
2	Study of Thermocouple & Thermostat.
3	Dismantling, reassembling, testing & repairs of Tea- coffee maker, Electric toaster.
4	Testing & repairing of Oven ,OTG,
5	Testing & repairing of Switches, Fuse.
6	Study, maintenance & repair of Water Heater & Geyser.
7	Testing & repairing of Room Heater, Hair dryer.
8	Testing & repairing of Electric door bell, Fan Regulator.
9	Testing & repairing of Tube -light, Torch, Table Lamp.
10	Market survey: Comparative study of electrical appliances.
11	Visit to Electrical appliances service & repair shop.

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Second Year: Semester –I

Paper Code: BVET36 Title: Lab Practical-3 (Based on BVET33) Credits: 6

Sr.No	Name of Practical
1	Study of 3 Phase Induction Motor.
2	Study of 3 Phase Transformer.
3	Different Method of Starting Of Three-Phase Squirrel Cage Induction Motor and Their Comparison. [DOL, Auto-Transformer, Star-Delta]
4	Speed control of three-phase slip ring induction motor by rotor resistance control.
5	Load test on single phase induction motor to obtain the performance characteristics.
6	Load test on Three Phase wound rotor induction motor to obtain the performance characteristics.
7	Study of various types of starters used for 3-phase induction motor.
8	oc & sc tests on 1-φ transformer
9	Measure the slip of 3 phase Induction Motor by using Tachometer.
10	Industrial Visit report of Electrical Motor manufacturing or repairing maintenance.

Advanced Diploma in Electrical Technology

Second Year: Semester –II

Paper Code: BVET40 Title: Environment Awareness Credits: 4

Units	Name of Unit	Content
I	Multidisciplinary nature of environmental studies	Definition, scope and importance
II	Natural Resources	Renewable and non-renewable resources: Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. b) Water resources c) Energy resources
III	Ecosystems	Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids, Introduction, types, characteristic features, structure and function of the Following ecosystem: - a. Forest ecosystem b. Grassland ecosystem c.Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)
IV	Biodiversity and its conservation	Introduction – Definition: genetic, species and ecosystem diversity, Biogeographical classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
V	Environmental Pollution	Definition, Cause, effects and control measures of:-a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards.
VI	Environment Protection Act.	Air (Prevention and Control of Pollution) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act.

Advanced Diploma in Electrical Technology

Second Year: Semester –II

Paper Code: BVET41

Credits: 4

Title: Entrepreneurship and Employable Skill

Units	Name of Unit	Content
I	Personal Strengths & Value Systems	Health, Habits, Hygiene: What is Health? Safety: Tips to Design a Safe Workplace, Honesty & Work Ethics: What is Honesty? Creativity & Innovation: What is Creativity? Time Management
II	Digital Literacy: A Recap	Computer and Internet basics: Basic Parts of a Computer, MS Office and Email: About MS Office, E-Commerce: What is E-Commerce?
III	Money Matters	Personal Finance – Why to Save?: Importance of Saving, Types of Bank Accounts, Opening a Bank Account: Types of Bank Accounts, Costs: Fixed vs Variable: What are Fixed and Variable Costs?, Investment, Insurance and Taxes: Investment
IV	Preparing for Employment & Self Employment	Interview Preparation: How to Prepare for an Interview? Preparing an Effective Resume: How to Create an Effective Resume?, Interview FAQs
V	Understanding Entrepreneurship	Concept Introduction (Characteristic of an Entrepreneur, types of firms / types of enterprises), Leadership & Teamwork: Leadership and Leaders, Communication Skills: Listening & Speaking: The Importance of Listening Effectively, Entrepreneurship Support Eco - System: Who is an Entrepreneur? Success & Failures: Understanding Successes and Failures in Entrepreneurship
VI	Preparing to be an Entrepreneur	Market Study / The 4 Ps of Marketing / Imortance of an IDEA: Understanding Market Research, Business Entity Concepts: Basic Business Terminology, CRM & Networking: What is CRM?, Business Plan: Why Set Goals? Enterprise Management - An Overview: How to Manage Your Enterprise.

Advanced Diploma in Electrical Technology

Second Year: Semester –II

Paper Code: BVET42 Title: Basic Electronics Credits: 4

Units	Name of Unit	Content
I	Semiconductor Diode	Construction, symbol, working principal, specification, application, forward and reverse biasing and V-I characteristics PN junction diode, Zener diode, Special Diode-LED
II	Rectifiers and Filters	Types of rectifiers- Half wave & Full wave rectifiers: circuits operation waveforms of voltage and current, Types of Filters: shunt capacitor, series inductor, LC and π filter.
III	Transistor	Different types of transistor: PNP, NPN, Transistor configuration: CB,CC,CE , Transistor as a switch.
IV	Regulator and Power Supply	Load and line regulation, basic zener diode voltage regulator, Regulator IC: 78XX, 79XX, IC732, Variable and Dual Regulated DC power supply.
V	Oscillators	Types of feedback: Positive & Negative feedback, Oscillator: circuit diagram and working of LC, RC and crystal oscillator**.**
VI	Digital Electronics	Number System: binary, octal, decimal and hexadecimal number system, Basic Logic gates.

Advanced Diploma in Electrical Technology

Second Year: Semester –II

Paper Code: BVET43 Title: Electrical Measurement & Instrumentation Credits: 4

Units	Name of Unit	Content
I	Classification of Measuring Instruments	Characteristics of measuring instruments: static and dynamic, Necessity of calibration, standards and their classification, absolute and secondary instruments, types of secondary instruments: indicating, integrating, and recording, Analog / digital. Essentials of indicating instruments deflecting, controlling and damping systems. Construction, working principle, torque equation, advantages and disadvantages of Moving Iron (MI) and Permanent Magnet Moving Coil (PMMC), block diagram and operation of digital ammeter voltmeter.
II	Range Extension Measuring Instruments	PMMC ammeters and voltmeters using shunts, multipliers. Universal shunt, universal multiplier. Instrument Transformers: Construction, connection of CT & PT in the circuit, advantages of CT / PT over shunt and multipliers for range extension of MI Instruments,
III	Measurement of Resistance & Inductance	Measurement of low, medium and high resistance. Wheatstone bridge, Kelvin's double bridge, ammeter-voltmeter method, megger, loss of charge method. Earth tester for earth resistance measurement, Measurement of inductance: Maxwell's inductance & Maxwell's inductance – Capacitance Bridge
IV	Measurement of Power	Construction, working principle, torque equation, errors and their compensation, advantages and disadvantages of dynamometer type wattmeter, low power factor wattmeter, poly-phase wattmeter. Active & reactive power measurement in three phase system for balanced and unbalanced load using three wattmeter method, two wattmeter method & one wattmeter method, Power analyzer, Multi meter.
V	Measurement of Energy	Construction, working principle, torque equation, errors and adjustments of single phase conventional (induction type) energy meter. Calibration of energy meter. Three phase energy meter, TOD meter.
VI	Transducers	Introduction, classification, types: resistive, inductive, capacitive, basic requirements for transducers. LVDT

Advanced Diploma in Electrical Technology

Second Year: Semester –II

Paper Code: BVET44 Title: Lab Practical-1 (Based on BVET42) Credits: 6

Sr.No	Name of Practical
1	Study of CRO
2	V-I characteristics of PN junction diode
3	V-I characteristics of zener diode and zener regulator characteristics
4	V-I characteristics of led
5	half-wave rectifier with and without filter
6	full-wave rectifier with and without filter
7	To study drain characteristics and transfer characteristics
8	To verify the truth table for Logic Gates (AND & OR) using Diodes.
9	To understand working of transistor as a switch. To draw DC load line for given circuit.
10	Industrial Visit report of any Electronic Industry.

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Second Year: Semester –II

Paper Code: BVET45 Title: Lab Practical-1 (Based on BVET43) Credits: 6

Sr.No	Name of Practical
1	Demonstration of working parts of various types of meter by opening the instrument & explanation of symbols & notations used on instruments.
2	Measurement of active & reactive power in three phase circuit using two wattmeter methods (balanced & unbalanced loads)
3	Measurement of active & reactive power in three phase balanced circuit using one wattmeter method with two way switch.
4	Displacement measurement by LVDT
5	Measurement of temperature by thermocouple.
6	Measurement of water level using strain gauge based water level transducer
7	Extension of instrument range: ammeter, voltmeter using CT & PT.
8	Measurement of low resistance using Kelvin's double bridge.
9	Measurement of inductance using Anderson's bridge/ Maxwell's bridge.
10	Industrial visit Report of any Electrical Instrumentation Manufacturing Company.

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Second Year: Semester –II

Paper Code: BVET46 Title: Lab Practical-1 (Based on BVET43) Credits: 6

Sr.No	Name of Practical
1	To study different types of Electrical Insulting Material and their properties
2	To measure dielectric strength of solid insulating materials.
3	To measure dielectric strength of liquid insulating materials.
4	To understand the principle of thermocouple & to obtain characteristics of different thermocouples.
5	Measurement of Flux Density by Gauss-meter.
6	To study different types batteries.
7	To measure insulation resistance of material by using megger.
8	Minimum one visit should be arranged to an industry related to manufacturing of batteries, capacitors, cables, transformers (Any one industry). A hand written report should be submitted by every student as a part of term work.