LESSON PLAN

GP Kangra	Department: Electrical Engineering	Subject : EP-I			
	Course : Diploma	Duration: 3 Yrs.			
SYLLABUS COVERAGE	Total Period: 56	Theory : 56			

Sr. No.	Period Nos	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	05 (01-05)	**Sources of Electrical Power Generation**	1.1 Conventional sources of electrical power generation such as coal, hydro, nuclear, natural gases and their contribution in power generation in present energy scenario 1.2 Non-conventional sources of electrical power generation such solar, wind, mini hydro,geothermal, tidal: Their relevance and contribution in power generation in present energy scenario	A Course in Electrical Power by A. Chakarborty, M.L. Soni, P.V. Gupta and U.S. Bhatnagar, Dhanpat Rai & Sons, New Delhi)	Principles of Power Systems by VK Mehta, S Chand and Co., New Delhi	
2	12 (06-17)	**Hydro-electric Power Plant**	2.1 Introduction: Hydrology, Calculation of power generated in hydro power plant. 2.2 Hydro power plant layout, function of each component. 2.3 Selection of site for hydro power plant. 2.4 Classification of hydro power on the basis of water discharge & head available. 2.5 Water Turbine: Various types of water turbines and their comparison on the basis of head, discharge, speed and direction of water flow 2.6 Merits and demerits of hydro power plant.	-------do----- -------do-----	-------do------ -------do-----	
3	11 (18-28)	**Steam Power Plant**	3.1 Site selection for steam power plant 3.2 Layouts of various sections in steam power plant 3.3 Function of heat exchanger, economizer & cooling tower in steam power plant 3.4 Efficiency of steam power plant 3.5 Merits and demerits of steam power plant	-------do-----	-------do-----	

4	06 (29-34)	**Nuclear Power Plant**	4.1 Introduction: Nuclear reaction, nuclear fission & fusion. 4.2 Site selection for nuclear power plant 4.3 Layout of nuclear power plant & function of each component 4.4 Nuclear reactor control 4.5 Safety issues and their remedial measures in nuclear power plant 4.6 Merits and demerits of Nuclear Power Plants 4.7 Nuclear waste disposal	-------do-----	-------do------
5	04 (35-38)	**Diesel Power Plant**	5.1 Elements of Diesel Power Plant & function of each components 5.2 Merits and demerits of diesel power plant 5.3 Performance and efficiency of diesel power plant 5.4 Applications of diesel power plant	-------do-----	-------do-----
6	12 (39-50)	**Economics of Power Generation**	6.1 Fixed and running cost, load estimation, load curves, connected load, maximum demand, demand factor, diversity factor, Chronological load curve, load duration curve, Energy load curve, load factor, Capacity factor, utilization factor, numerical problems. 6.2 Classification of Power Plants: Base load, peak load and standby power stations, stand by capacity in power plants, selection of number and size of units for different types of power stations. 6.3 Inter-connection of power stations and its advantages, concept of regional and national grid.	-------do-----	-------do-----
7	06 (51-56)	**Tariffs**	7.1 Concept of Tariffs 7.2 Types of Tariff system, Numerical problems related to electricity tariff	-------do-----	-------do-----

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Date: 20-12-2019	

LESSON PLAN

GP Kangra	Department: Electrical Engineering	Subject : EDC-II		
	Course : Diploma	Duration: 3 Yrs.		
SYLLABUS COVERAGE	Total Period: 56	Theory : 56		

Sr. No.	Period Nos	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	11 (01-11)	**Sinusoidal Oscillators**	-Working Principle of Oscillator, Use of positive feedback in amplifier circuit; Barkhausen criterion, Difference between Oscillator & Electrical Generator. -Different Types of Oscillator circuits: Tuned collector, Hartley, Colpitts, Phase shift, Wien Bridge, and Crystal oscillator-Their working principle, frequency range and applications	Principles of Electronics by VK Mehta (S.Chand)	Electronics Principles by Malvino (TMH)	
2	06 (12-17)	**Tuned Voltage Amplifier**	-Series and Parallel Resonant Circuits, Comparison between Series and Parallel resonant Circuits, -Single & Double Tuned Voltage Amplifier Circuits and their frequency response	-------do-----	-------do------	
3	07 (18-24)	**Wave Shaping Circuits**	- Integrating and differentiating circuits: Their working and applications - Diode Clipping circuits, biased Clipping circuits - Clamping circuits	-------do-----	-------do-----	
4	08 (25-32)	**Multivibrator Circuits**	- Working principle of Transistor as Switch - Concept of Multi-vibrator: Astable, Monostable, and Bistable - Block diagram of IC555 and its working and applications - Working of IC555 as astable and monostable multivibrator - Applications of Multivibrator Circuits	-------do-----	-------do-----	

5	10 (33-42)	**Operational Amplifiers**	- Characteristics of an ideal operational amplifier and its block diagram, Pin Identification of IC741 - Definitions: Differential voltage gain, CMRR, slew rate, input offset current, input offset voltage, total output offset voltage. - Open loop configurations: Differential, Inverting & Non Inverting modes, limitations of open loop configuration. - Closed loop configuration: As an Inverting & Non-inverting amplifier, Schmitt trigger circuit, Comparator, Differentiator and Integrator	-------do-----	-------do------	
6	06 (43-48)	**Optoelectronic Devices**	-Working principle of Photo-resistor, photo diode, photo transistor and their applications, -Need for Opto-isolation in electronic circuit, Working of optocoupler circuit.	-------do-----	-------do-----	
7	08 (49-56)	**Regulated Power Supplies**	- Working of DC regulated power Supply - Line and load side regulation - Regulator ICs (78XX, 79XX) -Switching Mode Power Supply: Working Principle, advantages & applications.	-------do-----	-------do-----	

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Date: 20-12-2019	

Lesson Plan

Gp Kangra	Department: Electrical Engineering		Subject : EM-II		
Syllabus Coverage	Course : Diploma		Duration: 3 Yrs.		
	Total Period: 56		Theory : 56		
Sr. No.	Period Nos.	Topic	Details	Instruction reference	Additional Study Recommended	Remarks
1	8 (1-8)	Rotating Machine: Basic Concepts	1.1 Principle of Energy conversion 1.2 Rotating Electrical Machine: definition of electrical machine, generator & motor 1.3 Physical concept of torque production: electromagnetic torque, reluctance torque and concept of torque angle	Electrical Machines by SK Bhattacharya, Tata McGraw Hill, New	Electrical Machines by JB Gupta, SK Kataria and Sons, New Delhi	
2	10(9-18)	DC Machines	2.1 Constructional features of DC Machine 2.2 Type of windings in DC machine: field and armature windings 2.3 Armature windings: lap & wave winding, armature winding terminologies (conductor, turn, coil, coil group, pole pitch, coil span, full-pitched coil, shortpitched coil, back & front-pitch) 2.4 Function of the Commutator inMotoring and Generating action 2.5 Armature Reaction in DC machine 2.6 Commutation, cause of sparking, method to improve commutation 2.7 Power flow diagram of DC Machines	Electrical Machines by SK Sahdev, Unique International		

3	16(19-34)	DC Generator	3.1 Working principle of DC generator 3.2 Induced EMF equation & factors determining the EMF of generator 3.3 Electromagnetic torque equation & factors determining the torque 3.4 Relationship between generated EMF and generator terminal voltage3.5 Types of DC generator: separately excited, shunt wound, series wound and compound (differential or cumulative type) generator 3.6 Necessary conditions to build up induced EMF in a DC shunt generator. 3.7 Operating characteristics of separately excited, Shunt, Series and Compound DC generator 3.8 Losses in DC Generator, Efficiency of DC Generator	Publications, Jalandhar		
4	18(35-52)	DC Motor	4.1 Working principle of DC motor 4.2 Back EMF equation and its significance 4.3 Torque equation of DC motor 4.4 Equivalent Circuit diagram 4.5 Relationship between back EMF and terminal voltage 4.6 Types of DC motors: Series motor, Shunt motor and Compound motor (differential and cumulative) 4.7 Need of Starter, 3-point Starter, 4-point Starter 4.8 Speed control of DC series and shunt motors: Armature & Field control methods and Ward Leonard method. 4.9 Operating characteristics of DC motors: Shunt, Series and Compound motors. 4.10 Effect of armature resistance on Torque-speed curve, 4.11 Losses in DC motor, Efficiency of DC motor: Direct method (direct mechanical loading method), Indirect method (Swinburne's method) and regenerative method (Hopkison's method)			
5	4 (52-56)	Applications and Maintenance of DC Machine	5.1 DC generator applications 5.2 DC motor applications 5.3 DC Machines (motor & generator) testing and maintenance			
Date :		20/12/19		H.O.D. Signature		
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LESSON PLAN

Gp Kangra	Department: Electrical Engineering	Subject : DE	
Syllabus Coverage	Course : Diploma	Duration: 3 Yrs.	
	Total Period: 56	Theory : 56	

Sr. No.	Period Nos.	Topic	Details	Instruction reference	Additional Study Recommended	Remarks
1	4 (1-4)	**Introduction**	Analog Signal, Digital Signal, Difference between Analog & Digital Signal, Applications & Advantages of Digital Signal	Modern Digital Electronics by R. P. Jain Fundamentals of Digital Circuits by A. Anand Kumar, PHI Publications	Digital Electronics by Pratima Manhas & Shaveta Thakral, KATSON Publication, New	
2	8 (5-12)	**Number System**	Binary, Octal, & Hexadecimal number systems, Conversion from Decimal, Octal & Hexadecimal Systems to Binary System & Vice Versa. - Binary Addition, Subtraction, Multiplication, Division, 1's and 2's compliment methods of subtraction. - Concept of code: 8421, BCD, Excess 3 and Gray Code - Concept of Parity			
3	10 (13-22)	**Logic Gate and Families**	Logic symbol, logical expression and truth table of AND, OR, NOT, NAND, NOR, EX- OR gates, -Universal property of NAND and NOR gate. - Logic Simplification Circuits-Basic laws of Boolean algebra, Duality theorem, De Morgan's Theorems. - Boolean expressions using Sum of Products (SOP) and Product of Sums (POS) forms. - K-map representation of logical functions. - Minimization of logical expressions using K-map (2, 3, 4 variables). -Logic Gates & Families (SSI, MSI, LSI, VLSI, ULSI)			
4	6 (23-28)	**Arithmetic Circuits**	Half Adder/Full Adder Circuit, their design and implementation - Half Subtracter /Full Subtracter Circuit, their design and implementation			

5	8 (29-36)	**Decoder, Encoder, Multiplexer & De-Multiplexer**	Basic binary decoder, Encoder-Decimal to BCD Encoder - Block diagram, Truth table, Logical expression and logic diagram of Multiplexers (4:1 and 8:1). - Block diagram and Truth table of Demultiplexer (1:4 and 1:8)			
6	14 (37-50)	**Flip Flops, Counters, Shift-Registers**	One-bit memory cell, clock signal, Latch-SR Latch, Difference between Latch & Flip-Flop **-Flip Flops**: S- R Flip flop, D- Flip Flop, J-K Flip Flop, Master Slave Flip-Flop, T- Flip Flop **-Counters**: Asynchronous Counters I Ripple Counter (2 bit, 3-bit, Decade) : Synchronous Counters (2-bit, 3-bit, decade synchronous counter), Ring Counter **-Shift Registers**: Concept of Shift registers, Types of Shift registers (SISO, SIPO, PISO, PIPO and Universal Shift Registers) - Applications of Flip-Flops, Counters & Shift Registers			
7	2 (51-52)	**Memories**	Classification of Memories RAM, ROM, PROM, EPROM, E2PROM, Cache Memory, Static and Dynamic RAM			
8	4 (53-56)	**D/A & A/D Converters**	Digital to Analog Converters (Weighted register, R-2R Ladder D/A Converter) Analog to Digital Converter (Dual Slope method, Successive Approximation A/D Converter) Applications of A/D & D/A Converter			

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Date : 20-12-2019	

Lesson Plan

GP Kangra		Department: Electrical Engineering		Subject : EEMI		
		Course : Diploma		Duration: 3 Yrs.		
SYLLABUS COVERAGE		Total Period: 64		Theory : 64		
		Name of Faculty: Swati Sharma		Session : April-July 2021		
Sr. No.	Period Nos	Topic	Details	Instruction Reference	Additional Study Recommended	Remark
1	05 (1-5)	**Introduction to Electrical Measuring Instruments**	1.1 Concept of Measurement and Instruments. 1.2 Block diagram of generalized measurement Systems. 1.3 Measurement Terms: Accuracy, precision, linearity sensitivity, reproducibility, dead band, Range 1.4 Types of electrical measuring instruments – indicating, integrating and recording type instruments. 1.5 Essentials of indicating instruments – deflecting, controlling and damping torque, methods of achieving deflecting & controlling torques in analog instruments.	Electrical Measurements and Measuring Instruments by JB Gupta (SK Kataria) Electrical Measurements and Measuring Instruments by ML Anand (SK Kataria)	Modern Electronic Instrumentation and Measurement Technique by Cooper & Helfrick (Pearson) A Course in Electrical & Electronic Measurement and Instrumentation by AK Sawhney (Dhanpat Rai)	
2	06 (06-11)	**Ammeters and Voltmeters (Moving coil and moving iron type)**	2.1 Concept of Galvanometer, Ammeter, Voltmeter and difference between them, Extension of the range of ammeter & voltmeter, Numerical related to extension of range of meters. 2.2 Construction and working principles of moving Iron and moving coil instruments. 2.3 Merits and demerits, sources of error and application of these instruments.	-----do-----	------do------	

3	04 (12-15)	**Wattmeter (Dynamometer Type)**	3.1 Construction, working principle, merits and demerits of dynamometer type wattmeter, sources of error.	-----do-----	------do------	
4	05 (16-20)	**Energy Meter (Induction type)**	4.1 Construction, working principle, merits and demerits of single-phase and three-phase energy meters, numerical problems. 4.2 Errors and their compensation. 4.3 Construction and working principle of maximum demand indicator.	-----do-----	------do------	
5	06 (21-26)	**Measurement of Resistance, Inductance & Capacitance using Bridges**	5.1 Principal of Working of Wheatstone Bridge - Limitations of Wheatstone bridge - Measurement of medium resistance by ammeter, voltmeter method - Kelvin's double bridge for measurement of low resistance. 5.2 A.C. bridges: Maxwell Bridge for Inductance measurement, Wien Bridge for Capacitance measurement.	-----do-----	------do------	
6	08 (27-34)	**Miscellaneous Measuring Instruments**	Construction, working principle and applications of- 6.1 Meggar (Insulation Resistance tester) 6.2 Earth tester 6.3 Frequency meter (dynamometer type) 6.4 Single phase power factor meter (Electrodynamometer type). 6.5 Synchroscope 6.6 Clamp-on meter. 6.7 LCR meter	-----do-----	------do------	

7	08 (35-42)	**Electronic Instruments**	7.1 Cathode Ray Oscilloscope: Block diagram, working principle of CRO and its various controls. Applications of CRO. 7.2 Digital multi-meter (only block diagram) and Applications. 7.3 Introduction and block diagram of Digital single phase and three phase Energy meters. 7.4 Introduction to Intelligent Energy Meter, Load manager.	-----do-----	------do------	
8	14 (43-56)	**Transducers & Their Application in Measurement of Non-electrical Quantities**	8.1 Introduction and classification of transducers 8.2 Use of Potentiometers in displacement measurement 8.3 Working principle and applications of LVDT. 8.4 Pressure sensing devices, measurement of pressure using - LVDT and Bourdon tube arrangement - Manometer 8.5 Working principle Strain gauge and its applications in measurements, temperature compensation using Strain gauge bridges. 8.6 Measurement of temperature using - Thermometers - Thermocouple - Resistance temperature detector - Thermistor - Optical Pyrometer. 8.7 Electromagnetic flow meter for flow measurement 8.8 Liquid level measurement using - Floats - Resistive and Capacitive probes 8.9 Introduction to Smart Sensors.	-----do-----	-----do--------	