CAPITAL SCHOOL OF ENGINEERING

PLOT NO. 1288, MAHATAPALLA, BAJAPUR, KHURDA,PIN-752060
Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory
Section : A
Semester : 5

Branch Name: ELECTRICAL
Subject Name: TH 3 : Digital Electronics & Microprocessor
Teacher Name: IPSITA SAHOO

Credit '--' External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Fundamental of Digital Electronics Ananda Kumar PHI
2	Microprocessor Architecture programming & Application with 8085 R.S Gaonkar Peneram

Reference books:

Sl.No	Reference books
1	Digital Electronics – Principal & Application S. K. Mondal TMH
2	Microprocessor and Inter facing Sunetra Choudhury & S. P. Chowdhury Scitech

Course Outcomes:

Sl.No	Course Outcomes
1	Comprehend the systems and codes
2	Familiar with logic gates
3	Realize logic expressions using gates
4	Construct and verify the operation of arithmetic & logic circuits
5	Understand and appreciate the relevance of combinational circuits
6	Know various logic families & flops
7	Architecture & different instructions of 8085 microprocessor
8	Assembly language programs and write programs & functions of the interfacing chips like 8255, 8259, 8259 etc

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	BASICS OF DIGITAL ELECTRONICS	Binary, Octal, Hexadecimal number systems and compare with Decimal system	Cos 1	
2	2	BASICS OF DIGITAL ELECTRONICS	Binary addition, subtraction, Multiplication and Division	Cos 1	
3	3	BASICS OF DIGITAL ELECTRONICS	1's complement and 2's complement numbers for a binary number	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
4	4	BASICS OF DIGITAL ELECTRONICS	Subtraction of binary numbers in 2's complement method	Cos 1	
5	5	BASICS OF DIGITAL ELECTRONICS	Use of weighted and Un-weighted codes & write Binary equivalent number for a number in 8421, Excess-3 and Gray Code and vice-ve	Cos 1	
6	6	BASICS OF DIGITAL ELECTRONICS	Importance of parity Bit	Cos 1	
7	7	BASICS OF DIGITAL ELECTRONICS	Logic Gates: AND, OR, NOT, NAND, NOR and EX-OR gates with truth table	Cos 1	
8	8	BASICS OF DIGITAL ELECTRONICS	Realize AND, OR, NOT operations using NAND, NOR gates	Cos 1	
9	9	BASICS OF DIGITAL ELECTRONICS	Different postulates and De-Morgan's theorems in Boolean algebra	Cos 1	
10	10	BASICS OF DIGITAL ELECTRONICS	Use Of Boolean Algebra For Simplification Of Logic Expression	Cos 1	
11	11	BASICS OF DIGITAL ELECTRONICS	Karnaugh Map For 2,3,4 Variable, Simplification Of SOP And POS Logic Expression Using K-Map	Cos 1	
12	12	COMBINATIONAL LOGIC CIRCUITS	Give the concept of combinational logic circuits	Cos 2	
13	13	COMBINATIONAL LOGIC CIRCUITS	Half adder circuit and verify its functionality using truth table	Cos 2	
14	14	COMBINATIONAL LOGIC CIRCUITS	Realize a Half-adder using NAND gates only and NOR gates only	Cos 2	
15	15	COMBINATIONAL LOGIC CIRCUITS	Full adder circuit and explain its operation with truth table	Cos 2	
16	16	COMBINATIONAL LOGIC CIRCUITS	Realize full-adder using two Half-adders	Cos 2	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			and an OR – gate and write truth table		
17	17	COMBINATIONAL LOGIC CIRCUITS	Full subtractor circuit and explain its operation with truth table	Cos 2	
18	18	COMBINATIONAL LOGIC CIRCUITS	Operation of 4 X 1 Multiplexers and 1 X 4 demultiplexe	Cos 2	
19	19	COMBINATIONAL LOGIC CIRCUITS	Working of Binary-Decimal Encoder & 3 X 8 Decode	Cos 2	
20	20	COMBINATIONAL LOGIC CIRCUITS	Working of Two bit magnitude comparator	Cos 2	
21	21	SEQUENTIAL LOGIC CIRCUITS	Give the idea of Sequential logic circuits	Cos 2	
22	22	SEQUENTIAL LOGIC CIRCUITS	State the necessity of clock and give the concept of level clocking and edge triggering	Cos 2	
23	23	SEQUENTIAL LOGIC CIRCUITS	Clocked SR flip flop with preset and clear inputs	Cos 2	
24	24	SEQUENTIAL LOGIC CIRCUITS	Construct level clocked JK flip flop using S-R flip-flop and explain with truth table	Cos 2	
25	25	SEQUENTIAL LOGIC CIRCUITS	Concept of race around condition and study of master slave JK flip flop	Cos 2	
26	26	SEQUENTIAL LOGIC CIRCUITS	Give the truth tables of edge triggered D and T flip flops and draw their symbols	Cos 2	
27	27	SEQUENTIAL LOGIC CIRCUITS	Applications of flip flops	Cos 3	
28	28	SEQUENTIAL LOGIC CIRCUITS	Define modulus of a counter	Cos 3	
29	29	SEQUENTIAL LOGIC CIRCUITS	4-bit asynchronous counter and its timing diagram	Cos 3	
30	30	SEQUENTIAL LOGIC CIRCUITS	Asynchronous decade counter	Cos 3	
31	31	SEQUENTIAL LOGIC	4-bit synchronous	Cos 3	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
		CIRCUITS	counter		
32	32	SEQUENTIAL LOGIC CIRCUITS	Distinguish between synchronous and asynchronous counters	Cos 3	
33	33	SEQUENTIAL LOGIC CIRCUITS	State the need for a Register and list the four types of registers	Cos 3	
34	34	SEQUENTIAL LOGIC CIRCUITS	Working of SISO, SIPO, PISO, PIPO Register with truth table using flip flop	Cos 3	
35	35	8085 MICROPROCESSOR	Introduction to Microprocessors, Microcomputers	Cos 6	
36	36	8085 MICROPROCESSOR	Architecture of Intel 8085A Microprocessor and description of each block	Cos 6	
37	37	8085 MICROPROCESSOR	Pin diagram and description	Cos 4	
38	38	8085 MICROPROCESSOR	Stack, Stack pointer & stack top	Cos 4	
39	39	8085 MICROPROCESSOR	Interrupts	Cos 4	
40	40	8085 MICROPROCESSOR	Opcode & Operand	Cos 4	
41	41	8085 MICROPROCESSOR	Differentiate between one byte, two byte & three byte instruction with example	Cos 4	
42	42	8085 MICROPROCESSOR	Instruction set of 8085 example	Cos 4	
43	43	8085 MICROPROCESSOR	Addressing mode	Cos 5	
44	44	8085 MICROPROCESSOR	Fetch Cycle, Machine Cycle, Instruction Cycle, T-State	Cos 5	
45	45	8085 MICROPROCESSOR	Timing Diagram for memory read, memory write, I/O read, I/O write	Cos 5	
46	46	8085 MICROPROCESSOR	Timing Diagram for 8085 instruction	Cos 6	
47	47	8085 MICROPROCESSOR	Counter and time delay	Cos 6	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
48	48	8085 MICROPROCESSOR	Simple assembly language programming of 8085	Cos 6	
49	49	INTERFACING AND SUPPORT CHIPS	Basic Interfacing Concepts, Memory mapping & I/O mapping	Cos 1	
50	50	INTERFACING AND SUPPORT CHIPS	Functional block diagram and description of each block of Programmable peripheral interface Intel 8255	Cos 1	
51	51	INTERFACING AND SUPPORT CHIPS	Functional block diagram and description of each block of Programmable peripheral interface Intel 8255	Cos 1	
52	52	INTERFACING AND SUPPORT CHIPS	Application using 8255: Seven segment LED display, Square wave generator, Traffic light Controller	Cos 1	
53	52	INTERFACING AND SUPPORT CHIPS	Application using 8255: Seven segment LED display, Square wave generator, Traffic light Controller	Cos 1	
54	53	INTERFACING AND SUPPORT CHIPS	Application using 8255: Seven segment LED display, Square wave generator, Traffic light Controller	Cos 1	
55	53	INTERFACING AND SUPPORT CHIPS	REVISION	Cos 1	

Dipsita Sahoo
Subject Teacher

HOD

Principal

CAPITAL SCHOOL OF ENGINEERING

PLOT NO. 1288, MAHATAPALLA, BAJAPUR, KHURDA,PIN-752060
Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory
Section : A
Semester : 5

Branch Name: ELECTRICAL
Subject Name: TH 5 : Power Electronics & PLC
Teacher Name: MADHUBRATA DASH

Credit '--' External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Power Electronics, Dr. P. S. Bhimbhra, Khanna Publisher
2	Modern Power Electronics , B.K.Bose, PHI Publisher
3	Programmable logic Controllers , Frank D. Petruzela, TMH

Reference books:

Sl.No	Reference books
1	Programme logic controller, Dr.M.Mitra&Dr.S.Sengupta, Penram

Course Outcomes:

Sl.No	Course Outcomes
1	Understand construction, working principle & application of various power electronics devices.
2	Know different gate triggering circuits and commutation methods.
3	Understand working principle of phase controlled rectifier.
4	Know the types and working principle of inverter.
5	Understand working principle and voltage control of chopper.
6	Understand frequency variation using Cyclo-converter
7	Understand control principle of AC & DC industrial drive.
8	Know different application of SCR / Thyristor.
9	Concept in PLC & its Programming

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	Construction, Operation, V-I characteristics & application of power diode, SCR, DIAC,TRIAC, Power MOSFET,GTO &IGBT	Cos 1	
2	2	1	Two transistor analogy of SCR, Gate characteristics of SCR	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
3	3	1	Switching characteristic of SCR during turn on and turn off	Cos 1	
4	4	1	Turn on methods of SCR.	Cos 1	
5	5	1	Turn off methods of SCR (Line commutation and Forced commutation), Load Commutation , Resonant pulse commutation	Cos 1	
6	6	1	Voltage and Current ratings of SCR.	Cos 1	
7	7	1	Protection of SCR , Over voltage protection ,Over current protection , Gate protection	Cos 1	
8	8	1	Firing Circuits ,General layout diagram of firing circuit, R firing circuit,	Cos 1	
9	9	1	R-C firing circuit ,UJT pulse trigger circuit	Cos 1	
10	10	1	Synchronous triggering (Ramp Triggering)	Cos 1	
11	11	1	Design of Snubber Circuits	Cos 1	
12	12	2	Controlled rectifiers Techniques	Cos 2	
13	13	2	(Phase Angle, ExtinctSingle quadrant semi converter, two quadrant full converter and dual Converter	Cos 2	
14	14	2	Working of single-phase half wave controlled converter with Resistive and R-L loads	Cos 2	
15	15	2	Understand need of freewheeling diode, Working of single phase fully controlled	Cos 2	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			converter with resistive and R- L loads.		
16	16	2	Working of three-phase half wave controlled converter with Resistive load	Cos 2	
17	17	2	Working of three phase fully controlled converter with resistive load.	Cos 2	
18	18	2	Working of single phase AC regulator	Cos 2	
19	19	2	Working principle of step up & step down chopper.	Cos 2	
20	20	2	Control modes of chopper	Cos 2	
21	21	2	Operation of chopper in all four quadrants.	Cos 2	
22	22	3	Classify inverters.	Cos 3	
23	23	3	Explain the working of series inverter	Cos 3	
24	24	3	Explain the working of parallel inverter	Cos 3	
25	25	3	Explain the working of single-phase bridge inverter	Cos 3	
26	26	3	Explain the basic principle of Cyclo-converter.	Cos 3	
27	27	3	Explain the working of single-phase step up & step down Cyclo-converter.	Cos 3	
28	28	3	Applications of Cyclo-converter.	Cos 3	
29	29	4	List applications of power electronic circuits	Cos 4	
30	30	4	List the factors affecting the speed of DC Motors.	Cos 4	
31	31	4	Speed control for DC Shunt motor using converter.	Cos 4	
32	32	4	Speed control for DC	Cos 4	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			Shunt motor using chopper.		
33	33	4	List the factors affecting speed of the AC Motors.	Cos 4	
34	34	4	Speed control of Induction Motor by using AC voltage regulator.	Cos 4	
35	35	4	Speed control of induction motor by using converters and inverters (V/F control)	Cos 4	
36	36	4	Battery charger circuit using SCR with the help of a diagram.	Cos 4	
37	37	4	Basic Switched mode power supply (SMPS) - explain its working & application	Cos 4	
38	38	5	Introduction of Programmable Logic Controller(PLC)	Cos 5	
39	39	5	Advantages of PLC	Cos 5	
40	40	5	Different parts of PLC by drawing the Block diagram and purpose of each part of PLC.	Cos 5	
41	41	5	Applications of PLC	Cos 5	
42	42	5	Ladder diagram	Cos 5	
43	43	5	Description of contacts and coils in the following states i)Normally open ii) Normally closed iii) Energized output iv)latched	Cos 5	
44	44	5	Ladder diagrams for i) AND gate ii) OR gate and iii) NOT gate.	Cos 5	
45	45	5	Ladder diagrams for combination circuits using NAND,NOR, AND, OR and NOT	Cos 5	
46	46	5	Timers-i)T ON ii) T OFF and iii)Retentive timer	Cos 5	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
47	47	5	Counters-CTU, CTD	Cos 5	
48	48	5	Ladder diagrams using Timers and counters	Cos 5	
49	49	5	PLC Instruction set	Cos 5	
50	50	5	Ladder diagrams for following (i) DOL starter and STAR-DELTA starter (ii) Stair case lighting (iii) Traffic light Control (i	Cos 5	
51	51	5	Special control systems- Basics DCS & SCADA systems	Cos 5	
52	52	5	SCADA	Cos 5	
53	53	5	Computer Control–Data Acquisition,	Cos 5	
54	54	5	Direct Digital Control System (Basics only	Cos 5	
55	55	5	class test	Cos 5	
56	56	5	clast test	Cos 5	
57	57	5	revison	Cos 5	
58	58	5	revison	Cos 5	
59	59	5	previous year question discussion	Cos 5	
60	60	5	class test	Cos 5	

Madhubreata Dash
Subject Teacher

MDash
HOD

Principal

CAPITAL SCHOOL OF ENGINEERING

PLOT NO. 1288, MAHATAPALLA, BAJAPUR, KHURDA,PIN-752060

Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory
Section : A
Semester : 5

Branch Name: ELECTRICAL
Subject Name: TH 2 : Energy Conversion-II
Teacher Name: GOPAL CH MARTHA

Credit " External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Electrical Technology J. B. Gupta
2	Electrical Machines D P Kothari, I J Nagrath

Reference books:

Sl.No	Reference books
1	Electrical Technology – II B. L. Theraja and A. K. Theraja

Course Outcomes:

Sl.No	Course Outcomes
1	To know about the Alternator and its application
2	To know about the Synchronous motor and its application
3	To know about the Induction Motor and its application
4	To know about the Single phase induction motor and its application
5	To know about the COMMUTATOR MOTORS and its application.
6	To know about the special type Motor and three phase Transformer its application.

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	Types of alternator and their constructional features	Cos 1	
2	2	1	Basic working principle of alternator and the relation between speed and frequency.	Cos 1	
3	3	1	Terminology in armature winding and expressions for winding factors	Cos 1	
4	4	1	Pitch factor, Distribution factor	Cos 1	
5	5	1	Explain harmonics, its causes and impact on	Cos 1	

No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			winding factor		
6	6	1	E.M.F equation of alternator. (Solve numerical problems)	Cos 1	
7	7	1	Explain Armature reaction and its effect on emf at different power factor of load.	Cos 1	
8	8	1	The vector diagram of loaded alternator. (Solve numerical problems)	Cos 1	
9	9	1	Testing of alternator	Cos 1	
10	10	1	Open circuit test	Cos 1	
11	11	1	Short circuit test.	Cos 1	
12	12	1	Determination of voltage regulation of Alternator by direct loading and synchronous impedance method.	Cos 1	
13	13	1	Solve numerical problems	Cos 1	
14	14	1	Parallel operation of alternator using synchro-scope	Cos 1	
15	15	1	Parallel operation of alternator using bright lamp method.	Cos 1	
16	16	1	Explain distribution of load by parallel connected alternators	Cos 1	
17	17	2	Constructional feature of Synchronous Motor.	Cos 2	
18	18	2	Principles of operation, concept of load angle	Cos 2	
19	19	2	Derive torque, power developed.	Cos 2	
20	20	2	Effect of varying load with constant excitation	Cos 2	
21	21	2	Effect of varying excitation with constant load.	Cos 2	

No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
22	22	2	Power angle characteristics of cylindrical rotor motor	Cos 2	
23	23	2	Explain effect of excitation on Armature current and power factor.	Cos 2	
24	24	2	Hunting in Synchronous Motor.	Cos 2	
25	25	2	Function of Damper Bars in synchronous motor and generator	Cos 2	
26	26	2	. Describe method of starting of Synchronous motor	Cos 2	
27	27	2	. State application of synchronous motor.	Cos 2	
28	28	3	Production of rotating magnetic field.	Cos 3	
29	29	3	Constructional feature of Squirrel cage and Slip ring induction motors.	Cos 3	
30	30	3	Working principles of operation of 3-phase Induction motor	Cos 3	
31	31	3	Define slip speed, slip and establish the relation of slip with rotor quantities	Cos 3	
32	32	3	Derive expression for torque during starting and running conditions and derive conditions for maximum torque. (solve numerical p	Cos 3	
33	33	3	Torque-slip characteristics	Cos 3	
34	34	3	Derive relation between full load torque and starting torque etc. (solve numerical problems	Cos 3	
35	35	3	Establish the relations between Rotor Copper loss, Rotor	Cos 3	

.No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			output and Gross Torque and relationship of slip with rotor copper loss		
36	36	3	Methods of starting and different types of starters used for three phase Induction motor	Cos 3	
37	37	3	Explain speed control by Voltage Control, Rotor resistance control, Pole changing, frequency control methods	Cos 3	
38	38	3	Plugging as applicable to three phase induction motor.	Cos 3	
39	39	3	. Describe different types of motor enclosures	Cos 3	
40	40	3	. Explain principle of Induction Generator and state its applications.	Cos 3	
41	41	4	Explain Ferrari's principle	Cos 4	
42	42	4	Explain double revolving field theory and Cross-field theory to analyze starting torque of 1-phase induction motor.	Cos 4	
43	43	4	Working principle, Torque speed characteristics, performance characteristics of single phase induction motor	Cos 4	
44	44	4	application of following single phase motors.	Cos 4	
45	45	4	Explain the method to change the direction of rotation of above motors.	Cos 4	
46	46	5	Construction, working	Cos 5	

No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			output and Gross Torque and relationship of slip with rotor copper loss		
36	36	3	Methods of starting and different types of starters used for three phase Induction motor	Cos 3	
37	37	3	Explain speed control by Voltage Control, Rotor resistance control, Pole changing, frequency control methods	Cos 3	
38	38	3	Plugging as applicable to three phase induction motor.	Cos 3	
39	39	3	. Describe different types of motor enclosures	Cos 3	
40	40	3	. Explain principle of Induction Generator and state its applications.	Cos 3	
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44	44	4	application of following single phase motors.	Cos 4	
45	45	4	Explain the method to change the direction of rotation of above motors.	Cos 4	
46	46	5	Construction, working	Cos 5	

NO.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			principle, running characteristic and application of single phase series motor.		
47	47	5	Construction, working principle and application of Universal motors.	Cos 5	
48	48	5	Working principle of Repulsion start Motor, Repulsion start Induction run motor, Repulsion Induction motor.	Cos 5	
49	49	6	Principle of Stepper motor.	Cos 6	
50	50	6	Classification of Stepper motor.	Cos 6	
51	51	6	Principle of variable reluctant stepper motor	Cos 6	
52	52	6	Principle of Permanent magnet stepper motor.	Cos 6	
53	53	6	Principle of hybrid stepper motor.	Cos 6	
54	54	6	Applications of Stepper motor.	Cos 6	
55	55	7	Explain Grouping of winding, Advantages.	Cos 6	
56	56	7	Explain parallel operation of the three phase transformers.	Cos 6	
57	57	7	Explain tap changer (On/Off load tap changing)	Cos 6	
58	58	7	Maintenance Schedule of Power Transformers.	Cos 6	
59	59	7	Application of three phase winding	Cos 6	
60	60	7	Condition of parallel operation three phase transformer.	Cos 6	

Subject Teacher **HOD** **Principal**

CAPITAL SCHOOL OF ENGINEERING

PLOT NO. 1288, MAHATAPALLA, BAJAPUR, KHURDA,PIN-752060
Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory

Branch Name: ELECTRICAL
Subject Name: TH 4 : Utilization of Electrical Energy & Traction
Teacher Name: R.KRISHNA RANI

Section : A
Semester : 5

Credit '--' External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Utilization of Electrical Energy by Traction, G. C. Garg, Khanna Publisher
2	Utilization of Electrical Energy, E. I. Taylor, TMH

Reference books:

Sl.No	Reference books
1	A Text book on Power system Engineering, Soni, Gupta and Bhatnagar, Dhanpat Rai & Sons

Course Outcomes:

Sl.No	Course Outcomes
1	To acquire knowledge of principle of ionic dissociation and electrolysis and loss involving in the process, usage of this proce
2	To acquire knowledge of types of electrical heating as employed in the electrical oven, induction furnaces and arc furnaces and
3	To acquire knowledge of principle of arc welding and resistant welding
4	To define various terms used in illumination engineering to design lighting schemes with specific attention to laws of illumina
5	To classify various types of industrial drives and their application.
6	To classify various methods of traction and traction motor with their control and types of braking.

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	Definition and Basic principle of Electro Deposition.	Cos 1	
2	2	1	important terms regarding electrolysis.	Cos 1	
3	3	1	Faradays Laws of Electrolysis	Cos 1	
4	4	1	Definitions of current efficiency, Energy efficiency.	Cos 1	
5	5	1	Principle of Electro Deposition.	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
6	6	1	Factors affecting the amount of Electro Deposition.	Cos 1	
7	7	1	Factors governing the electro deposition.	Cos 1	
8	8	1	State simple example of extraction of metals.	Cos 1	
9	9	1	Application of Electrolysis.	Cos 1	
10	10	2	Advantages of electrical heating.	Cos 2	
11	11	2	Mode of heat transfer and Stephen's Law	Cos 2	
12	12	2	Principle of Resistance heating. (Direct resistance and indirect resistance heating.)	Cos 2	
13	13	2	Discuss working principle of direct arc furnace and indirect arc furnace.	Cos 2	
14	14	2	Principle of Induction heating, Working principle of direct core type, vertical core type and indirect core type Induction fur	Cos 2	
15	15	2	Principle of coreless induction furnace and skin effect.	Cos 2	
16	16	2	Principle of dielectric heating and its application.	Cos 2	
17	17	2	Principle of Microwave heating and its application	Cos 2	
18	18	3	Explain principle of arc welding.	Cos 3	
19	19	3	Discuss D. C. & A. C. Arc phenomena	Cos 3	
20	20	3	. D.C. & A. C. arc welding plants of single and multi-operation type	Cos 3	
21	21	3	Types of arc welding.	Cos 3	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
22	22	3	Explain principles of resistance welding.	Cos 3	
23	23	3	Descriptive study of different resistance welding methods.	Cos 3	
24	24	4	Nature of Radiation and its spectrum.	Cos 4	
25	25	4	Terms used in Illuminations. [Lumen, Luminous intensity, Intensity of illumination, MHCP, MSCP, MHSCP, Solid angle, Brightness,	Cos 4	
26	26	4	Explain the inverse square law and the cosine law.	Cos 4	
27	27	4	Explain polar curves.	Cos 4	
28	28	4	Describe light distribution and control. Explain related definitions like maintenance factor and depreciation factors.	Cos 4	
29	29	4	Design simple lighting schemes and depreciation factor.	Cos 4	
30	30	4	Constructional feature and working of Filament lamps, effect of variation of voltage	Cos 4	
31	31	4	Explain Discharge lamps.	Cos 4	
32	32	4	State Basic idea about excitation in gas discharge lamps.	Cos 4	
33	33	4	State constructional factures and operation of Fluorescent lamp. (PL and PLL Lamps)	Cos 4	
34	34	4	Sodium vapor lamps.	Cos 4	
35	35	4	High pressure mercury vapor lamps.	Cos 4	
36	36	4	Neon sign lamps	Cos 4	
37	37	4	High lumen output & low consumption	Cos 4	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			fluorescent lamps		
38	38	5	State group and individual drive.	Cos 5	
39	39	5	Method of choice of electric drives.	Cos 5	
40	40	5	Explain starting and running characteristics of DC and AC motor.	Cos 5	
41	41	5	State Application of DC motor.	Cos 5	
42	42	5	3-phase induction motor.	Cos 5	
43	43	5	3 phase synchronous motors.	Cos 5	
44	44	5	Single phase induction, series motor, universal motor and repulsion motor.	Cos 5	
45	45	6	Explain system of traction.	Cos 6	
46	46	6	System of Track electrification.	Cos 6	
47	47	6	Running Characteristics of DC and AC traction motor	Cos 6	
48	48	6	Tapped field control.	Cos 6	
49	49	6	Rheostatic control.	Cos 6	
50	50	6	Series parallel control.	Cos 6	
51	51	6	. Multi-unit control.	Cos 6	
52	52	6	Metadyne control.	Cos 6	
53	53	6	Regenerative Braking.	Cos 6	
54	54	6	Braking with 1-phase series motor.	Cos 6	
55	55	6	Magnetic Braking.	Cos 6	
56	56	6	revison	Cos 6	
57	57	6	revison	Cos 6	
58	58	6	class test	Cos 6	
59	59	6	problem	Cos 6	
60	60	6	problem	Cos 6	

R. Krishna Rani.
Subject Teacher

HOD

Principal