Discipline :- ELECTRICAL	Semester:- 5th	Name of the Teaching Faculty:-KRUSHNA CHANDRA BISOYI
ENTREPRENEURSHIPand MANAGEMENT & SMART TECHNOLOGY	No of Days/per Week Class Allotted :-04	Semester From:-01/08/ 2023 To:- 30/11/2023 No of Weeks:- 15
Week	**Class Day**	**Theory**
1st	1st	**1. Entrepreneurship** Concept / Meaning of Entrepreneurship ,
	2nd	Need of Entrepreneurship , Characteristics
	3rd	Quality and Types of Entrepreneur,Functions,
	4th	Barriers of entrepreneurship
2nd	1st	Entrepreneur Vs Manager
	2nd	Forms of Business Ownership ; Sole proprietorship, partnership forms and others
	3rd	Types of industries, Concept of start-ups
	4th	Entrepreneurial support agencies at National , State , District Level (sources): DIC , NSIC, OSIC, SIDBI, NABARD , Commerecial Banks , KVIC etc
3rd	1st	Technology business incubators (TBI) and Science and Technology Entrepreneur Parks
	2nd	**2.Market Survey and Opportunity Identification (Business Planning)** Business planning
	3rd	SSI, Ancillary Units , Tiny Units , Service sector Units
	4th	Time schedule plan , Agencies to be contacted for project Implementation
4th	1st	Assessment of Demand and Supply
	2nd	Potential areas of Growth
	3rd	Identifying Business Oppertunity
	4th	Final product selection
5th	1st	**3.Project report Preparation** Preliminary project report
	2nd	Detailed project report
	3rd	Techno economic feasibility
	4th	Project viability
6th	1st	**4.Management Principles** Definations of management
	2nd	Principles of management
	3rd	Functions of management (planning, organizing staffing, directing and controlling etc.)
	4th	Level of Management in an Organisation
7th	1st	**5.Functional Areas of management** a)Production management->Functions , activities , Productivity
	2nd	Quality control , Production planning and control
	3rd	b)Inventory Management Need for Inventory management
	4th	Model/ Techniques of inventory management
8th	1st	c)Financial management Functions of financial management , management of working capital, Costing (only concept) ,Break even analysis

	2nd	Brief idea about accounting Terminologies: Book Keeping , Jourrnal entry ,Petty Cash book , P & L Accounts, Balance Sheets (only concepts)
	3rd	d)Marketing Management Concept of Marketing and Marketing Management Marketing Techniques (only concept)
	4th	Concept of 4P s (price ,place ,product ,promotion)
9th	1st	e)Human Resource Management Function of Personnel Management, Man power planning ,
	2nd	Recruitment ,Sources of manpower ,Selection of manpower , Selection process , Method of Testing ,
	3rd	Methods of Training & Development , Payment of Wages
	4th	**6.Leadership and Motivation** a)Leadership Defination and Need/ Importance
10th	1st	Qualities and Functions of a leader
	2nd	Manager Vs Leader
	3rd	Style of leadership (Autocratic , Democratic , Participative)
	4th	b)Motivation Defination and Characteristics, Importance of motivation
11th	1st	Factors affecting motivation
	2nd	Theories of motivation (Maslaw)
	3rd	Methods of improving Motivation
	4th	Importance of Communication in Business
12th	1st	**7.Work Culture , TQM & Safety** Types and Barriers of Communication
	2nd	Human relationship and Performance in Organization
	3rd	Relation with Peers , Superiors and Subordinates
	4th	TQM concepts: Quality policy , Quality Management , Quality system
13th	1st	Accidents and safety , causes and preventive measures
	2nd	General safety Rules, Personal Protection Equipment (PPE)
	3rd	**8.Legislation** Intellectual Property Rights (IPR)
	4th	Patents, Trademarks, Copyrights
14th	1st	Features of factories Act 1948with amendment(only salient point)
	2nd	Features of Payment of Wages Act 1936(only salient point)
	3rd	**9.Smart Technology** Concept of IOT ,How IOT works
	4th	Components of IOT
15th	1st	Characteristics of IOT ,Categories of IOT
	2nd	Application of IOT – Smart cities ,Smart transportion
	3rd	Smart Home , Smart Healthcare Smart industry
	4th	Smart Agriculture, Smart Energy Manaagementetc

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Discipline :- **ELECTRICAL**	Semester:- **5th**	Name of the Teaching Faculty: - **LIPIKA SANDHA**
Subject:- **DIGITAL ELECTRONICS& MICROPROCESSOR (TH-3)**	No of Days/per Week Class Allotted :- **05**	Semester From:- **01/08/ 2023** To:- **30/11/2023** No. Of weeks:15
Week	**Class Day**	**Theory**
1st	1st	Introduction to **DIGITAL ELECTRONICS**
	2nd	**NUMBER SYSTEMS AND CODES**
	3rd	List different number system & their relevance: binary, octal, decimal, Hexadecimal, Study the Conversion from one number system to another
	4th	Perform Arithmetic operations of binary number systems.
	5th	1's & 2's complement of Binary numbers., Perform Subtraction of binary numbers using complementary numbers. Perform multiplication and division of binary numbers.
2nd	1st	Define concept of Digital Code & its application. Distinguish between weighted & non-weight Code
	2nd	Study Codes: definition, relevance
	3rd	Types of code (8-4-2-1, Gray, Excess-3 and importance of parity bit.
	4th	**LOGIC GATES**
	5th	Discuss the Basic Logic & representation using electric signals
3rd	1st	Learn the Basic Logic gates (NOT, OR, AND, NOR, NAND, EX-OR & EXNOR) – Symbol, function, expression, truth table & example IC nos.
	2nd	Define Universal Gates with examples & realization of other gates
	3rd	**BOOLEAN ALGEBRA**
	4th	Understand Boolean : constants, variables & functions. Comprehend the Laws of Boolean algebra
	5th	State and prove Demorgan's Theorems. Represent Logic Expression : SOP & POS forms & conversion
4th	1st	Simplify the Logic Expression/Functions (Maximum of 4 variables) : using Boolean algebra and Karnaugh's map methods
	2nd	What is don't care conditions ? Realisation of simplified logic expression using K-Map
	3rd	Realisation of simplified logic expression using gates. Illustrate with examples the above.
	4th	**COMBINATIONAL CIRCUITS**
	5th	Define a Combinational Circuit and explain with examples. Arithmetic Circuits (Binary)

5th	1st	Realise function, functional expression, logic circuit, gate level circuit, truth table & applications of Half-adders,
	2nd	Full-adder & full-Subtractor. Explain Serial & Parallel address: concept comparison & application
	3rd	Discuss Multiplexers: definition, relevance, gate level circuit of simple. De-multiplexers (1:4) logic circuit with truth Table
	4th	Explain the working of Binary-Decimal Encoder & Decoder.
	5th	Working of 2-bit Magnitude Comparator: logic expression, truth table
6th	1st	**SEQUENTIAL CIRCUITS**
	2nd	Define Sequential Circuit : Explain with examples.
	3rd	Know the Clock-definition characteristics, types of triggering & waveform.
	4th	Define Flip-Flop, Study RS, Clocked RS, D, T, JK, MS-JK flip-flop with logic Circuit and truth tables.
	5th	Concept of Racing and how it can be avoided.
7th	1st	Applications of flip-flops & its conversion.
	2nd	**COUNTERS**
	3rd	List the different types of counters-Synchronous and Asynchronous.
	4th	Explain the modulus of a counter
	5th	**COUNTERS**
8th	1st	List the different types of counters-Synchronous and Asynchronous. Explain the modulus of a counter 4-bit asynchronous counter with timing diagram
	2nd	Asynchronous decade counter
	3rd	4-bit synchronous counter
	4th	Compare Synchronous and Asynchronous counters and know their ICs nos.
	5th	**REGISTERS**
9th	1st	Explain the working of various types of shift registers – SISO
	2nd	SIPO
	3rd	PISO
	4th	PIPO, with truth table using flip flop.
	5th	**8085 MICRO PROCESSOR**
10th	1st	Introduction to microprocessor, Micro computers
	2nd	Architecture of intel 8085A Microprocessor
	3rd	, Functional Block diagram and Description of each block.
	4th	Pin diagram and description.
	5th	Stack, Stack Pointer, Stack Top
11th	1st	Interrupts , Op-code & Operands
	2nd	Grouping and Explanation of different group instructions with examples
	3rd	Instruction sets &Addressing modes
	4th	Instruction fetching and execution, Timing diagram of different machine cycle.

	5th	Timing diagram of different machine cycle, 8085A timing states.
12th	1st	Basic Interfacing Concept , Memory Mapping & I/O Mapping
	2nd	Programmable peripheral interface Intel -8255, Functional block diagram and Operation of 8255, Programming of 8255
	3rd	Application Using 8255: Seven Segment LED display
	4th	Square Wave Generator
	5th	Traffic light controller
13th	1st	Doubt Clearing Classes and Revision of Syllabus
	2nd	
	3rd	
	4th	
	5th	
14th	1st	Previous Five (05) Years Semester Question Answer Discussion
	2nd	
	3rd	
	4th	
	5th	

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Discipline:- Electrical Engineering	Semester:- 5th	Name of the teaching faculty:-RAJASRI TRIPATHY
Subject:- Utilization Of Electrical Energy And Traction	No. of days/ per week class allotted:-4	Semester from:- **01/08/ 2023** To:- **30/ 11/2023** No. of weeks:15
Week	Class day	Theory
1st	1st	**1. ELECTROLYTIC PROCESS** 1.1 Definition and Basic principle of Electro Deposition.
2nd	1st	1.2 Important terms regarding electrolysis
	2nd	1.3 Faradays Laws of Electrolysis. 1.4 Definitions of current efficiency, Energy efficiency
	3rd	1.5 Principle of Electro Deposition.
3rd	1st	1.6 Factors affecting the amount of Electro Deposition
	2nd	1.7 Factors governing the electro deposition.
4th	1st	1.8 State simple example of extraction of metals.
	2nd	1.9 Application of Electrolysis.
	3rd	**ELECTRICAL HEATING** 2.1. Advantages of electrical heating. 2.2. Explain mode of heat transfer and Stephen's Law.
	4th	2.3. Discuss principle of Resistance heating. 2.3.1 Direct Resistance heating. 2.3.2 Indirect Resistance heating.
5th	1st	2.4. Explain working principle of direct arc furnace and indirect arc furnace.
	2nd	2.5. Principle of Induction heating
	3rd	2.6. Working principle of direct core type, vertical core type and indirect core type Induction furnace.
6th	1st	2.7. Principle of coreless induction furnace and skin effect.
	2nd	2.8. Principle of dielectric heating and its application
	3rd	2.9. Principle of Microwave heating and its application.
	4th	**PRINCIPLES OF ARC WELDING** 3.1 Explain principle of arc welding.
7th	1st	3.2 Discuss D. C. & A. C. arc phenomena
	2nd	3.3 D.C. & A. C. arc welding plants of single and multi-operation type.
	3rd	3.3 D.C. & A. C. arc welding plants of single and multi-operation type.
8th	1st	3.4 Types of arc welding
	2nd	3.4 Types of arc welding
	3rd	3.5 Explain principles of resistance welding.
	4th	3.6 Descriptive study of different resistance welding methods.

9th	1st	**4. ILLUMINATION** 4 . 1 Nature of Radiation and its spectrum.
	2nd	4 . 2 Terms used in Illuminations. i. Luminous intensity ii. Lumen iii. Intensity of illumination iv. MHCP v. MSCP vi. MHSCP vii. Brightness viii. Solid angle ix. Luminous efficiency
	3rd	4 . 3 Explain the inverse square law and the cosine law
	4th	4 . 4 Explain polar curves.
10th	1st	4 . 5 Describe light distribution and control. Explain related definitions like maintenance factor and depreciation factors.
	2nd	4 . 6 Design simple lighting schemes and depreciation factor.
	3rd	4 . 7 Constructional feature and working of Filament lamps, effect of variation of voltage on working of filament lamps.
	4th	4 . 8 Explain Discharge lamps.
11th	1st	4 . 9 State Basic idea about excitation in gas discharge lamps.
	2nd	4 . 10 State constructional factures and operation of: - Fluorescent lamp. (PL and PLL Lamps)
	3rd	4.11 Sodium Vapor lamp 4.12 High Pressure Mercury vapor lamp
	4th	4.13 Neon sign lamp 4.14 High Lumen output & low consumption fluorescent lamp
12th	1st	**INDUSTRIAL DRIVES** 5 . 1 State group and individual drive.
	2nd	5 . 1 State group and individual drive.
	3rd	5 . 2 Method of choice of electric drives.
	4th	5 . 2 Method of choice of electric drives.
13th	1st	5 . 2 Method of choice of electric drives
	2nd	5 . 3 Explain starting and running characteristics of DC and AC motor.
	3rd	5 . 3 Explain starting and running characteristics of DC and AC motor.
	4th	5 . 3 Explain starting and running characteristics of DC and AC motor.
14th	1st	5 . 4 State Application of : 5.4.1 DC motor 5.4.2 3- phase induction motor

	2nd	5.4.3 3-phase synchronous motors. 5.4.4 Single phase induction ,series motor, universal motor &repulsion motor
	3rd	**ELECTRIC TRACTION** 6. 1. Explain system of traction.
	4th	6. 1. Explain system of traction
	1st	6. 2. System of Track electrification
	2nd	6. 2. System of Track electrification
	3rd	6. 2. System of Track electrification
	4th	6. 3. Running Characteristics of DC and AC traction motor
	1st	6. 3. Running Characteristics of DC and AC traction motor
	2nd	6. 3. Running Characteristics of DC and AC traction motor
	3rd	6. 4. Explain control of motor 6.4.1 Tapped field control
	4th	6. 4. Explain control of 6.4.2 Rheostatic control 6.4.3 Series parallel control
	1st	6. 4.4 Multi-unit control 6.4.5Metadyne control
	2nd	6. 5. Explain Braking of the following types. 6.5.1 Regenerative Braking
	3rd	6.5.2 Braking with 1-phase series motor
	4th	6.5.3 Magnetic Braking6

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Discipline:- Electrical Engineering	Semester:- 5th	Name of the teaching faculty:- Prabhat Rashmi Mallik
Subject:- Energy conversion -II	No. of days/ per week class allotted:-4	Semester from:- **01/08/ 2023** To:- **30/11/2023** No. of weeks:15
Week	Class day	Theory
1st	1st	1. ALTERNATOR: 1.1. Types of alternator and their constructional features
2nd	1st	1.2. Basic working principle of alternator and the relation between speed and frequency.
	2nd	1.3. Terminology in armature winding and expressions for winding factors (Pitch factor, Distribution factor). 1.4. Explain harmonics, its causes and impact on winding factor.
	3rd	1.5. E.M.F equation of alternator. (Solve numerical problems).
3rd	1st	1.6. Explain Armature reaction and its effect on emf at different power factor of load.
	2nd	1.7. The vector diagram of loaded alternator. (Solve numerical problems)
4th	1st	1.8. Testing of alternator (Solve numerical problems) 1.8.1. Open circuit test. 1.8.2. Short circuit test
	2nd	1.9. Determination of voltage regulation of Alternator by direct loading and synchronous impedance method. (Solve numerical problems)
	3rd	1.10. Parallel operation of alternator using synchro-scope and dark & bright lamp method
	4th	1.11. Explain distribution of load by parallel connected alternators.
5th	1st	2. SYNCHRONOUS MOTOR: 2.1. Constructional feature of Synchronous Motor. 2.2. Principles of operation, concept of load angle
	2nd	2.3. Derive torque, power developed. 2.4. Effect of varying load with constant excitation
	3rd	2.5. Effect of varying excitation with constant load..
6th	1st	2.6. Power angle characteristics of cylindrical rotor motor
	2nd	2.7. Explain effect of excitation on Armature current and power factor. 2.8. Hunting in Synchronous Motor
	3rd	2.9. Function of Damper Bars in synchronous motor and generator. 2.10. Describe method of starting of Synchronous motor. 2.11. State application of synchronous moto
	4th	3. THREE PHASE INDUCTION MOTOR: 3.1. Production of rotating magnetic field.
7th	1st	3.2. Constructional feature of Squirrel cage and Slip ring induction motors.
	2nd	3.3. Working principles of operation of 3-phase Induction motor.. 3.4. Define slip speed, slip and establish the relation of slip with rotor quantities
	3rd	3.5. Derive expression for torque during starting and running conditions and derive conditions for maximum torque. (solve numerical problems)

8th	1st	3.6. Torque-slip characteristics. 3.7. Derive relation between full load torque and starting torque etc. (solve numerical problems)
	2nd	3.8. Establish the relations between Rotor Copper loss, Rotor output and Gross Torque and relationship of slip with rotor copper loss. (solve numerical problems) 3.9. Methods of starting and different types of starters used for three phase Induction motor.
	3rd	3.10. Explain speed control by Voltage Control, Rotor resistance control, Pole changing, frequency control methods
	4th	3.11. Plugging as applicable to three phase induction motor. 3.12. Describe different types of motor enclosures.
9th	1st	3.13. Explain principle of Induction Generator and state its applications.
	2nd	4. SINGLE PHASE INDUCTION MOTOR: 4.1. Explain Ferrari's principle.
	3rd	4.2. Explain double revolving field theory and Cross-field theory to analyze starting torque of 1-phase induction motor.
	4th	4.3. Explain Working principle, Torque speed characteristics, performance characteristics and application of following single phase motors . 4.3.1. Split phase motor. 4.3.2. Capacitor Start motor. 4.3.3. Capacitor start, capacitor run motor
10th	1st	4.3.4. Permanent capacitor type motor. 4.3.5. Shaded pole motor
	2nd	4.4. Explain the method to change the direction of rotation of above motors.
	3rd	5. COMMUTATOR MOTORS:
	4th	5.1. Construction, working principle
11th	1st	running characteristic and application of single phase series motor
	2nd	5.2. Construction, working principle of universal motor
	3rd	application of Universal motors
	4th	5.3. Working principle of Repulsion start Motor
12th	1st	Repulsion start Induction run motor
	2nd	Repulsion Induction motor
	3rd	6. SPECIAL ELECTRICAL MACHINE:
	4th	6.1. Principle of Stepper motor.
13th	1st	6.2. Classification of Stepper motor.

	2nd	6.3. Principle of variable reluctant stepper motor.
	3rd	6.4. Principle of Permanent magnet stepper motor
	4th	Doubt clear
14th	1st	6.5. Principle of hybrid stepper motor
	2nd	6.6. Applications of Stepper motor.
	3rd	7. THREE PHASE TRANSFORMERS:
	4th	7.1. Explain Grouping of winding, Advantages.
15th	1st	7.2. Explain parallel operation of the three phase transformers.
	2nd	7.3. Explain tap changer (On/Off load tap changing)
	3rd	7.4. Maintenance Schedule of Power Transformers.
	4th	Doubt clear

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Teaching Faculty

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Discipline-ElectricalEngg.	Semester-5th	Nameof theteachingfaculty- KRUSHNA CHANDRA BISOYI
Subject-Power electronics &PLC	Noofdays/week classallotted-4	Semesterfrom-**01/08/ 2023** To:- **30/11/2023** Noofweeks-15
Week	Classday	Theorytopic
1	1st	Construction,Operation,V-Icharacteristics&applicationofpowerdiode,SCR,DIAC,TRIAC,PowerMOSFET,GTO&IGBT.
	2nd	TwotransistoranalogyofSCR,GatecharacteristicsofSCR
	3rd	SwitchingcharacteristicofSCRduringturnonandturnoff,TurnonmethodsofSCR
	4th	NumericalrelatedtogateturnonandoffofMOSFET,BJT
2	1st	DifferentCommutationtechniques (Loadcommutation,voltagecommutationandcurrentcommutation)
	2nd	SCRprotection(GateProtection)
	3rd	Voltageprotectionandcurrentprotection
	4th	FiringCircuits(Generallayoutdiagramoffiringcircuit)
3	1st	Rfiringcircuits,R-Cfiringcircuit
	2nd	UJTpulsetriggercircuitandSynchronoustriggering(RampTriggering)
	3rd	LimitationsofRandRCfiringcircuits
	4th	DesignofSnubberCircuitsandnumericaltofindthevalueofRandC.
4	1st	**Doubtclearingandrevisionclass**
	2nd	ControlledrectifiersTechniques(PhaseAngle,ExtinctionAnglecontrol),Singlequadrantsemi converter,twoquadrantfullconverteranddualConverter
	3rd	Workingofsingle-phasehalfwave controlledconverterwithResistiveandR-Lloads
	4th	Problemsolvingandrealisingthe waveforms.
5	1st	Understandneedoffreewheelingdiode.
	2nd	Workingofsinglephasefullycontrolledconverterwithresistiveand R-Lloads.
	3rd	Workingofthree-phase halfwave controlledconverterwithResistive load
	4th	Workingofthreephasefullycontrolledconverterwithresistiveload.
6	1st	Doubtclearingandproblemsolving

	2nd	WorkingofsinglephaseACregulator.
	3rd	Workingprincipleofstepup&stepdownchopper
	4th	Controlmodes ofchopper
7	1st	Operationofchopperinallfourquadrants
	2nd	**UNDERSTANDTHEINVERTERSANDCYCLO-CONVERTERS**,Classifyinverters.
	3rd	Explaintheworking ofseriesinverter
	4th	Explaintheworkingofparallelinverter
8	1st	Explaintheworkingofsingle-phasebridgeinverter.
	2nd	Explainthebasicprincipleofcycloconverter
	3rd	Explaintheworkingofsingle-phasestepup&stepdownCyclo-converter
	4th	ApplicationsofCyclo-converter
9	1st	Problemsolvingoninverterandchopper
	2nd	**UNDERSTANDAPPLICATIONSOFPOWERELECTRONICCIRCUITS**,Listapplicationsof powerelectroniccircuits
	3rd	ListthefactorsaffectingthespeedofDCMotors
	4th	SpeedcontrolforDCShuntmotor usingconverter
10	1st	SpeedcontrolforDCShuntmotorusingchopper
	2nd	ListthefactorsaffectingspeedoftheACMotors
	3rd	SpeedcontrolofInductionMotorbyusingACvoltageregulator
	4th	Speedcontrolofinductionmotorbyusingconvertersandinverters(V/Fcontrol)
11	1st	WorkingofUPSwithblockdiagram
	2nd	Batterycharger circuitusingSCR withthehelpof adiagram
	3rd	BasicSwitchedmodepowersupply(SMPS)-explainitsworking &applications
	4th	Numericaloncyclo-converter
12	1st	**PLCANDITSAPPLICATIONS**,IntroductionofProgrammableLogicController(PLC)
	2nd	AdvantagesofPLC
	3rd	DifferentpartsofPLCbydrawingtheBlockdiagramandpurposeofeachpartofPLC.

	4th	**ApplicationsofPLC**
13	1st	DifferentLadderdiagrams
	2nd	Descriptionofcontactsandcoilsinthefollowingstatesi)Normallyopenii)Normallyclosediii) Energizedoutputiv)latchedOutputv)branching
	3rd	Ladderdiagramsfor i) ANDgateii)OR gateandiii) NOTgate
	4th	LadderdiagramsforcombinationcircuitsusingNAND,NOR,AND,ORandNOT
14	1st	Timers-i)TONii)TOFFandiii)Retentivetimer
	2nd	Counters-CTU,CTD
	3rd	LadderdiagramsusingTimersandcounters
	4th	PLCInstructionset
15	1st	Ladderdiagramsforfollowing(i)DOLstarterand STAR-DELTA starter (ii) Stair caselighting (iii)TrafficlightControl(iv)TemperatureController
	2nd	Specialcontrolsystems-BasicsDCS&SCADAsystems
	3rd	ComputerControl–Data Acquisition,DirectDigitalControlSystem(Basicsonly)
	4th	**DoubtClearance**

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