VASIREDDY VENKATADRI INSTITU

DEPARTMENT OF ELECTRICAL AND EL

R13 GRAND CO-PO-PS

I B.TECH I SI

R13101	ENGLISH-I	CO1	An ability to improve reading skills and comprehension.
		CO2	An ability to improve essential grammar.
		CO3	An ability to interact and share views and opinions.
		CO4	An ability to improve life skills and core skills.
		CO5	An ability to improve vocabulary.
		CO6	An ability to write effectively.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	-	-	-	-
CO2	-	-	-	-	-	-
CO3	-	-	-	-	-	-
CO4	-	-	-	-	-	-
CO5	-	-	-	-	-	-
CO6	-	-	-	-	-	-

R13102	MATHEMATICS-I	CO1	Able to solve first order ordinary Differential equations and their app
		CO2	Able to solve higher order ordinary differential equations.
		CO3	Able to learn Laplace transforms and solve initial value problems in c
		CO4	Able to learn Partial differentiation.
		CO5	Able to Solve first order partial differential equations.
		CO6	Able to Solve higher order partial differential equations.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	1	-	-	-
CO2	2	2	1	-	-	-
CO3	2	1	1	-	-	-
CO4	2	1	2	-	-	-
CO5	2	2	1	-	-	-
CO6	3	2	1	-	-	-

R13107	MATHEMATICS-II (MM)	CO1	Able to find roots of transcendental equations using Numerical meth
		CO2	Able to use interpolation methods.
		CO3	Able to use different numerical methods to solve ordinary differentia
		CO4	Able to find Fourier series for certain functions.
		CO5	Able to find Fourier transforms for certain functions.
		CO6	Able to solve difference equations using Z transforms.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	3	-	-	-
CO2	2	3	1	-	-	-
CO3	2	2	1	-	-	-
CO4	2	2	1	-	-	-

		CO5	2	2	3	-	-	-
		CO6	2	2	3	-	-	-

R13103	ENGG. PHYSICS	CO1	Students Acquire ability to apply knowledge of Physics.
		CO2	Students will be able to develop scientific point of view in solving pro
		CO3	Students will be able to design and analyze Laws and Principles of Ph
		CO4	Students will able to analyze the characteristics and performance of
		CO5	Students will able to explain the Quantum Mechanics and Electron T
		CO6	Students will able to explain the developed and performance of Sem

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	1	2	-	-
CO2	2	2	3	2	2	-
CO3	2	2	2	2	2	-
CO4	3	2	3	2	3	-
CO5	3	2	2	1	2	-
CO6	3	3	3	1	1	-

R13108	PROFESSIONAL ETHICS & HUMAN VALUES	CO1	Able to introduce the basic philosophy of morals, values and ethics t
		CO2	Able to impart reasoning and analytical skills needed to apply ethical
		CO3	Able to identify the moral issues involved in both management and e
		CO4	Able to understand the unethical errors committed by the engineers
		CO5	Able to minimize the occupational crimes in the corporate sector by
		CO6	Able to Focus on intellectual property rights and ethical engineering.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	-	1	1	-
CO2	2	-	-	2	1	-
CO3	1	-	-	3	1	-
CO4	2	-	-	1	2	-
CO5	2	-	-	1	1	-
CO6	1	-	-	1	2	-

R13109	ENGG. DRAWING	CO1	Able to understand different scales used in industry and draw variou
		CO2	Able to recognize principles of projections to draw orthographic proj
		CO3	Able to interpret the projection principles to draw projections of stra
		CO4	Able to understand the various ways to draw projection of planes.
		CO5	Able to draw projections of solids by applying principles of orthograp
		CO6	Able to convert isometric views into orthographic views and orthogr

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	2	-	-	-
CO2	3	2	2	-	-	-
CO3	3	2	2	-	-	-
CO4	2	2	2	-	-	-

		CO5	2	2	3	-	-	-
		CO6	2	2	3	-	-	-

	ENGLISH COMMUNICATION SKILLS LAB-I	CO1	Ability to analysis a topic of discussion & reading to it.
		CO2	Ability to participate in discussion & influence them.
		CO3	Ability to communicate ideas effectively.
		CO4	Ability to present opinions coherently within a stipulated time.
		CO5	Ability to speak clearly & coordinate with them.
		CO6	Ability to improve upon English language pronunciation.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	-	-	-	-
CO2	-	-	-	-	-	-
CO3	-	-	-	-	-	-
CO4	-	-	-	-	-	-
CO5	-	-	-	-	-	-
CO6	-	-	-	-	-	-

	ENGINEERING PHYSICS LAB	CO1	Able to under stand basic knowledge fphysics &experimental experie
		CO2	Able to understand basic electronics & experimental experience of e
		CO3	Able to understand electromagnetism and experimental experience.
		CO4	Able to understand the light properties & experimental experience c

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	-	-	-	1
CO2	3	-	3	-	2	2
CO3	3	-	-	-	-	2
CO4	3	1	1	-	-	3

	ENGINEERING WORKSHOP & IT WORKSHOP	CO1	To select suitable carpentry tools to prepare different types of joints
		CO2	To identify tools required in the fitting operation to perform joint pre
		CO3	To understand the process of making different objects with thin shee
		CO4	To differentiate single phase, 3 phase wiring connections.
		CO5	Identify the basic computer peripheral and gain sufficient knowledge
		CO6	Learn the installation procedure of Windows and Linux OS,
		CO7	Acquire knowledge on basic networking infrastructure and acquire k
		CO8	Learn productivity tools like Word, Excel and Power point.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	-	1	-	-	1
CO2	2	1	-	-	-	1
CO3	2	1	-	-	-	1
CO4	1		-	-	-	1
CO5	2	1	-	-	2	-
CO6	2	2	-	2	2	-

		CO7	1	1	1	1	2	-
		CO8	1	2	-	-	2	-

I B.TECH II S

R13201	ENGLISH-II	CO1	An ability to improve reading skills and comprehension.
		CO2	An ability to improve essential grammar.
		CO3	An ability to interact and share views and opinions.
		CO4	An ability to improve life skills and core skills.
		CO5	An ability to improve vocabulary.
		CO6	An ability to write effectively.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	-	-	-	-
CO2	-	-	-	-	-	-
CO3	-	-	-	-	-	-
CO4	-	-	-	-	-	-
CO5	-	-	-	-	-	-
CO6	-	-	-	-	-	-

R13202	MATHEMATICS-III	CO1	Able to solve system of linear equations using matrices.
		CO2	Able to find Eigen values - Eigen vectors.
		CO3	Able to evaluate multiple integrals and application of integrals.
		CO4	Able to evaluate integrals using special functions.
		CO5	Able to understand grad, curl and divergent of scalar and vector poi
		CO6	Able to understand relation between line, surface and volume integr

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	1	-	-	-
CO2	2	2	1	-	-	-
CO3	2	1	1	-	-	-
CO4	2	1	2	-	-	-
CO5	2	2	1	-	-	-
CO6	3	2	1	-	-	-

R13204	ENGG.CHEMISTRY	CO1	Able to understand the water quality analysis & preparation techniq
		CO2	They gain knowledge about construction & working of storage devic
		CO3	They are well known about corrosion preventive measurements.
		CO4	Able to understand the working of IC engines & refining of petrol.
		CO5	They gain the knowledge about conducting the polymers & fiber reir
		CO6	They are well known about advanced engineering materials like carb

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	1	-	-	-
CO2	2	2	1	-	-	-
CO3	2	1	1	-	-	-

		CO4	2	1	2	-	-	-
		CO5	2	2	1	-	-	-
		CO6	3	2	1	-	-	-

R13210	ENGG.MECHANICS	CO1	Able to explain the concepts of force and friction, direction and its ap
		CO2	Able to explain the application of free body diagrams. Solution to pro
		CO3	Able to explain the concepts of centre of gravity.
		CO4	Able to explain the concepts, moment of inertia and polar moment o
		CO5	Able to explain the motion in straight line and in curvilinear paths, its
		CO6	Able to explain the concepts of work, energy and particle motion Stu

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	-	2	2	3
CO2	2	2	-	2	2	3
CO3	2	2	-	2	2	3
CO4	3	2	-	2	3	3
CO5	3	2	-	1	2	2
CO6	3	3	-	1	1	3

R13212	Electrical Circuit Analysis - I	CO1	Able to solve Various electrical networks in presence of active and pa
		CO2	Able to solve any R, L, C network with sinusoidal excitation.
		CO3	Able to solve any R, L, C network with variation of any one of the par
		CO4	Able to solve any magnetic circuit with various dot conventions.
		CO5	Able to solve electrical networks with network topology concepts.
		CO6	Able to solve electrical networks by using principles of network theo

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	2			
CO2	3	2	1			
CO3	2	2	2	1		
CO4	3	2	2	1		1
CO5	3	2	3	1		1
CO6	3	2	1	1		

R13205	OMPUTER PROGRAMMING	CO1	Design algorithmic solutions to problems and implementing algorithı
		CO2	Illustrate branching, iteration and data representation using arrays.
		CO3	Implement modular programming and recursive solution formulatior
		CO4	Comprehend pointers and dynamic memory allocation.
		CO5	Implement user defined data types like structures and unions in C.
		CO6	Comprehend file operations.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	2	-	3	-
CO2	1	1	1	-	2	-
CO3	3	3	2	2	-	-

	C	CO4	1	2	3	3	-	-
		CO5	3	3	3	3	1	-
		CO6	2	3	3	3	-	-

	ENGG.CHEMISTRY LABORATORY	CO1	Able to understand water quality analysis.
		CO2	Able to understand significance of potentiometric &conductometric
		CO3	Able to analyze redoxometric titrations.
		CO4	Able to do quality analysis of cool drinks.
		CO5	Able to estimate amount of vitamin-c present in capsules.
		CO6	Able to determine concentration of unknown solutions by colorimet

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	2	-	-	-	2
CO2	1	1	-	-	-	-
CO3	1	1	-	-	-	-
CO4	1	1	-	-	-	-
CO5	1	2	-	-	-	1
CO6	1	2	-	-	-	2

	ENGLISH-COMMUNICATION SKILLS LAB-II	CO1	Ability to analysis a topic of discussion & reading to it.
		CO2	Ability to participate in discussion & influence them.
		CO3	Ability to communicate ideas effectively.
		CO4	Ability to present opinions coherently within a stipulated time.
		CO5	Ability to speak clearly & coordinate with them.
		CO6	Ability to improve upon English language pronunciation.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	-	-	-	-
CO2	-	-	-	-	-	-
CO3	-	-	-	-	-	-
CO4	-	-	-	-	-	-
CO5	-	-	-	-	-	-
CO6	-	-	-	-	-	-

	C.PROGRAMMING LAB	CO1	Read, understand and trace the execution of programs written in C l
		CO2	Write the C code for a given algorithm over numeric values and mat
		CO3	Implement Programs with pointers and arrays, perform pointer arith
		CO4	Implementing modular and recursive programs
		CO5	Write programs that perform operations using derived data types
		CO6	Implement programs for data transfers between files

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	3	-	-	-
CO2	2	2	2	3	-	-
CO3	2	2	2	3	-	-

		CO4	2	-	2	3	-	-
		CO5	2	2	1	2	-	-
		CO6	2	2	2	-	-	-

II B.TECH I S

RT21021	Electrical Circuit Analysis-II	CO1	Students are able to solve three- phase circuits under balanced cond
		CO2	Students are able to solve three- phase circuits under unbalanced co
		CO3	Students are able find out transient response of electrical networks
		CO4	Students are able to estimate the different types of two port networ
		CO5	Students are able to represent electrical equivalent network for a giv
		CO6	Students are able to extract different harmonics components from t

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	-	-	-	-
CO2	2	2	-	-	-	-
CO3	1	2	-	-	-	-
CO4	2	2	-	-	-	-
CO5	2	2	-	-	-	-
CO6	2	1	-	-	-	-

RT21022	Thermal and Hydro Prime Movers	CO1	Classify the heat engines , understand the working principles of IC er
		CO2	Discuss about the properties of steam, analysis of ranking cycle and
		CO3	Understand and analysis of Gas turbines
		CO4	Identify the significance of impulse momentum equation, understan
		CO5	Classify , working & design principles of hydraulic turbine including it
		CO6	Understand about hydro-electric power plant and calculation of diffe

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	1	1	0	0	0
CO2	2	2	3	3	2	0
CO3	3	0	0	3	3	0
CO4	2	2	2	2	3	0
CO5	3	2	2	2	1	0
CO6	3	2	2	3	2	1

RT21024	VARIABLE AND STATISTICAL METHODS	CO1	Apply mathematical reasoning and the theory of complex variables t
		CO2	Able to apply differnt integral theorems
		CO3	Able to understand differnt types of singularities and residue theore
		CO4	Able to apply different transformations methods.
		CO5	Calculate fundamental concepts such as the cumulative distribution
		CO6	Apply this knowledge to identify of Hypothesis testing by using the s

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	1	1	-	-
CO2	3	2	2	2	2	3

	COMPLEX	CO3	2	2	2	1	2	2
		CO4	3	2	3	2	3	2
		CO5	2	1	2	2	2	3
		CO6	2	3	3	1	1	2

RT21025	ELECTROMAGNETIC FIELDS	CO1	Ability to calculate electric field and potentials using guass's law or s
		CO2	Learn how to calculate capacitance, energy stored in dielectrics and
		CO3	Ability to find magnetic field intensity due to current, the application
		CO4	Students can calculate the magnetic forces and torque produced by
		CO5	Will the able to calculate self and mutual inductances and the energy
		CO6	Students will gain knowledge on time varying fields and get ability to

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	3			
CO2	3	2	2	2		1
CO3	3	2	3	2		1
CO4	2	2	2	2	1	1
CO5	3	2	1	1		
CO6	2	2	1	1		

RT21026	ELECTRICAL MACHINES – I	CO1	Able to explain the concepts of electromagnetic energy conversion.
		CO2	Able to explain the operation of dc generator, armature reaction and
		CO3	Able to analyze the characteristics and performance of dc generators
		CO4	Able to explain the torque developed and performance of dc motors
		CO5	Able to analyze the speed control and testing methods of dc motors.
		CO6	Able to propose design aspects of a dc machine.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	1			
CO2	3	2	3			
CO3	3	2	2			
CO4	3	2	3			
CO5	2	2	2			
CO6	2	3	3			

	RICAL CIRCUITS LAB	CO1	Able to experimentally verify the basic circuit theorems.
		CO2	Able to draw the locus diagrams, waveforms and phasor diagrams fo
		CO3	Able to determine the two port parameters of a given electric circuit
		CO4	To measure power and power factor in 3- phase circuit for unbalanc
		CO5	Able to know the resonance condition of a given network.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	2	2		2

	ELECTI	CO2	2	1	1	1		2
		CO3	2	2	1	1		1
		CO4	2	2	2	1		2
		CO5	2	1	2	1		1

II B.TECH II S

RT22021	ENVIRONMENTAL STUDIES	CO1	Understand the multidisciplinary nature of environmental studies an
		CO2	Natural resources and their importance, conservation measures.
		CO3	Biodiversity and its conservation practices.
		CO4	Various attributes of pollution & its control, solid waste managemen
		CO5	Social issues both rural & urban, environmental legislation's of India.
		CO6	Environmental management- EIA.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	1	-	-	-
CO2	2	2	1	-	-	-
CO3	2	1	1	-	-	-
CO4	2	1	2	-	-	-
CO5	2	2	1	-	-	-
CO6	3	2	1	-	-	-

RT22022	SWITCHING THEORY AND LOGIC DESIGN	CO1	Students will be aware of the philosophy of number systems and coc
		CO2	Students will be able to minimize the logic expressions using map me
		CO3	Students will be able to design the combinational logic circuits using
		CO4	Students will be able to design different PLD's such as PROM, PAL, PI
		CO5	Students will be able to use the concepts of various flip-flops, counte
		CO6	Students will be able to design asynchronous circuits like FSMs.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	1			
CO2	2	2	2	2	1	1
CO3	3	3	2	1		
CO4	3	2	2	2	1	1
CO5	3	2	2	1	1	
CO6	2	3	2	2	2	1

T22023	GITAL CIRCUITS	CO1	Understand and Apply the concept of linear wave shaping circuits lik
		CO2	Analyze the nonlinear wave shaping circuits like clippers & clampers
		CO3	Examine the switching characteristics of nonlinear elements used in
		CO4	Create the different types of multivibrator circuits.
		CO5	Evaluate different types of voltage and current time base generators
		CO6	Illustrate the principles of synchronisation and frequency division an

	PO1	PO2	PO3	PO4	PO5	PO6

RT	PULSE & DI	CO1	1	3	-	-	-	-
		CO2	1	3	-	-	-	-
		CO3	1	2	3	-	-	-
		CO4	1	2	3	-	-	-
		CO5	-	-	-	-	-	-
		CO6	-	2	-	-	-	-

RT22024	POWER SYSTEMS-I	CO1	Students are able to identify the different components of thermal po
		CO2	Students are able to identify the different components of nuclear Po
		CO3	Students are able to distinguish between AC & DC distribution syster
		CO4	Students are able to locate the different components of an air and ga
		CO5	Students are able to identify single core and multi core cables with d
		CO6	Students are able to analyse the effect of load factor, demand factor

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	2			
CO2	2	2	2	2		1
CO3	3	3	2	2		1
CO4	2	2	2	2	1	1
CO5	3	1	1	1		
CO6	2	2	1	1		

RT22025	ELECTRICAL MACHINES – II	CO1	Able to explain the operation and performance of single phase trans
		CO2	Able to explain the regulation losses and efficiency of single phase tr
		CO3	Able to explain types of three phase transformer connection, tap cha
		CO4	Able to explain the operation and performance of three phase induc
		CO5	Able to analyze the torque-speed relation, performance of induction
		CO6	Able to explain design procedure for transformers and three phase in

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	2		0	
CO2	3	2	2	2	0	1
CO3	3	1	2	2	0	1
CO4	2	2	2	2	0	1
CO5	2	1	1	1	0	
CO6	3	2	1	1	0	

	VIS	CO1	Ability to derive the transfer function of physical systems and determ
		CO2	Capability to determine time response specifications of second order
		CO3	Acquires the skill to analyze absolute and relative stability of LTI syst
		CO4	Capable to analyze the stability of LTI systems using frequency respo
		CO5	Able to design Lag, Lead, Lag-Lead compensators to improve system

RT22026 | CONTROL SYSTEI

CO6	Ability to represent physical systems as state models and determine

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	1		1	
CO2	3	2	1		1	
CO3	2	2	1		1	
CO4	2	2	1		1	
CO5	2	2	1		1	
CO6	2	2	1		1	

ELECTRICAL MACHINES – I LAB

CO1	To determine and predetermine the performance of DC machines.
CO2	To control the speed of DC motor.
CO3	To determine and predetermine the performance of Transformer.
CO4	To achieve three phase to two phase transformation

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	1	1	1	
CO2	2	2	1	1	1	
CO3	2	2	1	1	1	
CO4	2	2	1	1	1	

ELECTRONIC DEVICES & CIRCUITS LAB

CO1	Able To understand the characteristics of PN Junction and Zenor dio
CO2	Able To draw the characteristics of BJT, FET, SCR and UJT
CO3	Able To Analyze the applications of PN Junction as Rectifier
CO4	Able To analyze the operation of BJT and FET as a amplifier
CO5	Able To understand the operation of CRO

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	1	1	1	
CO2	2	1	1	1	1	
CO3	2	1	1	1	1	
CO4	2	1	1	1	1	
CO5	2	1	1	1	1	

III B.TECH I S

RT31022 | CONOMICS AND FINANCIAL ANALYSIS

CO1	Introduce Managerial Economics to engineering students, concepts c
CO2	Evaluate the student knowledge of production & cost estimation.
CO3	Introduce markets, theory of the firm and pricing policies in differen
CO4	To know the different forms of business organization and their merit
CO5	Understand the different accounting systems preparation of financia
CO6	Understand the concepts of capital, capitalization techniques used t

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	-	-	-	-

	MANAGERIAL E	CO2	3	3	3	-	-	-
		CO3	2	3	3	2	-	-
		CO4	2	3	3	3	-	-
		CO5	2	3	3	3	-	-
		CO6	2	3	3	3	-	-

RT31021	ELECTRICAL MEASUREMENTS	CO1	Able to choose right type of instrument for measurement of voltage
		CO2	Able to choose right type of instrument for measurement of power a
		CO3	Able to calibrate ammeter and potentiometer.
		CO4	Able to select suitable bridge for measurement of electrical paramet
		CO5	Able to use the ballistic galvanometer and flux meter for magnetic m
		CO6	Able to measure frequency and phase difference between signals us

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	2		2	
CO2	2	2	1		1	
CO3	2	1	1		1	
CO4	1	1			1	
CO5	1	1	1			1
CO6	1	2	2	1	1	

RT31023	POWER SYSTEMS–II	CO1	Able to understand parameters of various types of transmission lines
		CO2	Able to understand the insight into specific transmission lines short a
		CO3	able to understand the surge propagation, reflection and refraction i
		CO4	Able to utilize it for understanding the surge behaivour of transmissi
		CO5	Able to understand various phenomenon related to charged line tran
		CO6	Able to understand physical and geometrical parameters of transmis

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	3			
CO2	3	3	1			
CO3	1	3	1			
CO4	1	1				
CO5	1	2				
CO6	3	3	3			

4	HINES – III	CO1	Analyze the performance of single phase induction and ac series mot
		CO2	Explain the structure of synchronous machines and design the windi
		CO3	Develop solutions for regulation of both non salient pole and salient
		CO4	Explain the role of synchronous generators operation when connecte
		CO5	Analyze the performance of synchronous motor for development of
		CO6	Explain hunting phenomenon and methods of starting of synchronou

RT3102	ELECTRICAL MACI						
			PO1	PO2	PO3	PO4	PO5	PO6
		CO1	3	3	3		2	
		CO2	3	3	1		1	
		CO3	3	3	1		1	
		CO4	1	1			1	
		CO5	1	2	1			
		CO6	3	3	3		1	

RT31025	POWER ELECTRONICS	CO1	Explain the characteristics of various power semiconductor derive ar
		CO2	Design firing circuits for SCR. Analyze the operation of AC voltage co
		CO3	Explain the operation of single phase full–wave converters and analy
		CO4	Explain the operation of three phase full–wave converters and dual c
		CO5	Analyze the operation of single phase cyclo converters and high freq
		CO6	Explain the working of inverters and application of PWM techniques

			PO1	PO2	PO3	PO4	PO5	PO6
		CO1	3	2	1			
		CO2	2	2	2	2	1	1
		CO3	3	3	2	1	0	
		CO4	3	2	2	2	1	1
		CO5	3	2	2	1	1	
		CO6	2	3	2	2	2	1

RT31026	LINEAR & Digital IC APPLICATIONS	CO1	Draw a block diagram representing a typical op-amp with various de
		CO2	Differentiate between Ideal and Non-Ideal Op-Amp, Determination c
		CO3	Perform various mathematical Operations, Trigonometric & Logarith
		CO4	Study of 555 timer & its applications using Astable and Monostable C
		CO5	Can design various types of Active Filters such as LPF, HPF, BPF, BRF,
		CO6	Explain the operation of A/D and D/A Converters.

			PO1	PO2	PO3	PO4	PO5	PO6
		CO1	3	3	3		2	
		CO2	3	3	1		1	
		CO3	3	3	1		1	
		CO4	1	1			1	
		CO5	1	2	1	3		1
		CO6	3	3	3	1	1	

	s – II LAB	CO1	Able to assess the performance of single phase and three phase indu
		CO2	Able to control the speed of three phase induction motor.
		CO3	Able to predetermine the regulation of three–phase alternator by va

	ELECTRICAL MACHINES	CO4	Able to find the Xd/ Xq ratio of alternator and asses the performance

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	1	1	1	
CO2	2	1	1	1	1	
CO3	2	1	1	1	1	
CO4	2	1	1	1	1	

	CONTROL SYSTEMS LAB	CO1	Able to analyze the performance and working Magnetic amplifier, D.
		CO2	Able to design P, PI, PD and PID controllers and design lag, lead and l
		CO3	Able to control the temperature using PID controller and determine
		CO4	Able to control the position of D.C servo motor performance

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	-	1	1	
CO2	2	1	1	1	1	
CO3	1	-	-	-	1	
CO4	1	1	1	1	1	

RT31016	INTELLECTUAL PROPERTY RIGHTS AND PATENTS	CO1	Understanding, defining and differentiating different types of intelle
		CO2	Understanding the Framework of Strategic Management of Intellect
		CO3	Identify different types of Intellectual Properties (IPs), the right of ov
		CO4	Recognize the crucial role of IP in organizations of different industria
		CO5	Identify activities and constitute IP infringements and the remedies a
		CO6	Understanding, Identify various cybercrimes in online networks

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	2	3	2	2	2
CO2	-	2	3	1	2	2
CO3	-	1	2	-	3	3
CO4	1	3	3	2	2	2
CO5	-	-	3	-	2	-
CO6	-	2	2	-	-	2

III B.TECH II S

T32022	AND PROTECTION	CO1	To be able to understand the principles of arc interruption for applic
		CO2	Ability to understand the working principle and constructional featu
		CO3	Students acquire in depth knowledge of faults that is observed to oc
		CO4	Improves the ability to understand various types of protective schem
		CO5	Generates understanding of different types of static relays with a vie
		CO6	To be able to understand the different types of over voltages appear

	PO1	PO2	PO3	PO4	PO5	PO6

R	SWITCHGEAR	CO1	3	3	1			
		CO2	3	2	3			
		CO3	3	2	2			
		CO4	3	2	3			
		CO5	2	2	2			
		CO6	2	3	3			

RT32021	MICROPROCESSORS AND MICROCONTROLLERS	CO1	To be able to understand the microprocessor capability in general ar
		CO2	To be able to understand the addressing modes of microprocessors
		CO3	To be able to understand the micro controller capability
		CO4	To be able to program mp and mc
		CO5	To be able to interface mp and mc with other electronic devices
		CO6	To be able to develop cyber physical systems

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2					
CO2	2	1				
CO3	2	2	2			
CO4	2	2	2			
CO5	2					
CO6	2	2	2			

RT32023	UTILIZATION OF ELECTRICAL ENERGY	CO1	Able to identify a suitable motor for electric drives and industrial app
		CO2	Able to identify most appropriate heating or welding techniques for
		CO3	Able to understand various level of illuminosity produced by differen
		CO4	Able to estimate the illumination levels produced by various sources
		CO5	Able to determine the speed/time characteristics of different types c
		CO6	Able to estimate energy consumption levels at various modes of ope

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	1	1		
CO2	2	2	3	2	1	2
CO3	2	3	3	2	1	
CO4	1	2	3	1	2	1
CO5	3	1	2	2	1	1
CO6	1	1	1	1	2	

4	ANALYSIS	CO1	Able to draw an impedance diagram for a power system network an
		CO2	Able to find out the load flow solution of a power system network us
		CO3	Able to formulate the Zbus for a power system network.
		CO4	Able to find out the fault currents for all types faults with a view to p
		CO5	Able to find out the sequence components of currents for any unbal
		CO6	Able to analyze the steady state, transient and dynamic stability con

RT3202 — **POWER SYSTEM**

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	3	3	3	
CO2	2	2	3	2	1	2
CO3	2	3	3	2	1	
CO4	1	2	3	1	2	1
CO5	3	1	2	2	1	1
CO6	1	1	1	1	2	

RT32026 — **POWER SEMICONDUCTOR DRIVES**

CO1	Explain the fundamentals of electric drive and different electric brak
CO2	Analyze the operation of three phase converter controlled dc motors
CO3	Explain the converter control of dc motors in various quadrants.
CO4	Explain the concept of speed control of induction motor by using AC
CO5	Explain the principles of static rotor resistance control and various sl
CO6	Explain the speed control mechanism of synchronous motors

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1				1
CO2	2	1				1
CO3	2	1				1
CO4	2	1				1
CO5	2	1				1
CO6	2	1				1

RT32025 — **MANAGEMENT SCIENCE**

CO1	Apply Management Techniques and Strategies to understand and ide
CO2	Design and Conduct a work study and apply the Statistical Quality co
CO3	Discover the need of HRM functions to motivate the employees to a
CO4	Understand and identify various Networking techniques to save the
CO5	Use Various Business Strategies and Corporate planning process to a
CO6	Apply various contemporary management practices like ERP,BPO, TC

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	-	-	-	-
CO2	2	2	2	-	2	-
CO3	2	1	-	-	3	-
CO4	-	2	3	-	2	-
CO5	2	2	-	-	-	-
CO6	1	1	-	-	-	-

NICS LAB

CO1	Able to study the characteristics of various power electronic devices
CO2	Able to analyze the performance of single phase and three phase ful
CO3	Able to understand the operation of single phase AC voltage regulato
CO4	Able to understand the working of Buck converter, Boost converter,

			PO1	PO2	PO3	PO4	PO5	PO6
	POWER ELECTRO	CO1	2	1				
		CO2	2	1				
		CO3	2	1				
		CO4	1	1				

	ELECTRICAL MEASUREMENTS LAB	CO1	To be able to measure accurately the electrical parameters voltage,
		CO2	To be able to measure illumination of electrical lamps.
		CO3	To be able to test transformer oil for its effectiveness.
		CO4	To be able to measure the parameters of inductive coil.

		PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1					
CO2	1	1					
CO3	1	1					
CO4	1			1			

IV B.TECH I S

RT41021	RENEWABLE ENERGY SOURCES AND SYSTEMS	CO1	Analyze solar radiation data, extraterrestrial radiation, radiation on e
		CO2	Design solar thermal collections.
		CO3	Design solar photo voltaic systems.
		CO4	Develop maximum power point techniques in solar PV and wind.
		CO5	Explain wind energy conversion systems, Betz coefficient, tip speed r
		CO6	Explain basic principle and working of hydro, tidal, biomass, fuel cell

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3				
CO2	1	2				
CO3	1	2				
CO4	2	2				
CO5	3	2				
CO6	3	3				

RT41022	& DC TRANSMISSION	CO1	To be able to acquaint with HV transmission system with regard to p
		CO2	To develop ability for determining corona, radio interference, audibl
		CO3	To be able to acquire knowledge in transmission of HVDC power witl
		CO4	To be able to develop knowledge with regard to choice of pulse conv
		CO5	To develop knowledge of reactive power requirements of conventio
		CO6	Able to calculate voltage and current harmonics, and design of filters

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1				

	HVAC &	CO2	1	1				
		CO3	2	2	2			
		CO4	2	2				
		CO5	2	2	1			
		CO6	2	2	1			

RT41023	POWER SYSTEM OPERATION AND CONTROL	CO1	Able to compute optimal scheduling of Generators.
		CO2	Able to understand hydrothermal scheduling.
		CO3	Understand the unit commitment problem.
		CO4	Able to understand importance of the frequency.
		CO5	Understand importance of PID controllers in single area and two are
		CO6	Will understand reactive power control and line power compensatio

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	1	1		
CO2	3	2	1	1		
CO3	2	1				
CO4	2	1				
CO5	2	2				
CO6	3	2				

RT41025	INSTRUMENTATION	CO1	Able to represent various types of signals .
		CO2	Acquire proper knowledge to use various types of Transducers.
		CO3	Able to monitor and measure various parameters such as strain, velc
		CO4	Acquire proper knowledge and working principle of various types of
		CO5	Able to measure various parameter like phase and frequency of a sig
		CO6	Acquire proper knowledge and able to handle various types of signal

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	2	2	2	1
CO2	3	3	3	3	1	1
CO3	3	2	2	2	2	2
CO4	2	2	2	3	2	1
CO5	3	2	3	2	-	1
CO6	2	2	3	2	2	2

.029	BUTION SYSTEMS	CO1	Able to understand the various factors of distribution system.
		CO2	Able to design the substation and feeders.
		CO3	Able to determine the voltage drop and power loss
		CO4	Able to understand the protection and its coordination.
		CO5	Able to understand the effect of compensation on p.f improvement.
		CO6	Able to understand the effect of voltage, current distribution system

RT41

ELECTRICAL DISTRI

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	1			
CO2	3	2	3			
CO3	3	2	2			
CO4	3	2	3			
CO5	2	2	2			
CO6	2	3	3			

MICROPROCESSORS AND MICROCONTROLLERS LAB

CO1	Understand and apply the fundamentals of assembly level programn
CO2	Design interfacing circuits with 8086
CO3	Design and implement 8051 microcontroller based systems

	PO1	PO2	PO3	PO4	PO5	PO6
CO1					1	
CO2					1	
CO3					1	

ELECTRICAL SIMULATION LAB

CO1	Able to simulate integrator circuit, differentiator circuit, Boost conve
CO2	Able to simulate transmission line by incorporating line, load and tra
CO3	Able to perform transient analysis of RLC circuit and single machine
CO4	Able to find load flow solution for a transmission network with Newt

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	2	2	2	
CO2	2	2	2	2	2	
CO3	1	1	1	1		
CO4	1	2				

POWER SYSTEMS LAB

CO1	Able to understand the power flows and stability in power system.
CO2	Students can execute energy management systems functions at load
CO3	Able to understand affect of various faults in various power system
CO4	Able to determine the parameters of various power system compon

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	2	2	2	
CO2	2	2	2	2	2	
CO3	1	1	1	1		
CO4	1	2				

IV B.TECH II S

CO1	understand the concepts of digital control systems and assemble var
CO2	The theory of z–transformations and application for the mathematic

RT42021 — **DIGITAL CONTROL SYSTEMS**

CO3	Represent the discrete–time systems in state–space model and evalu
CO4	Examine the stability of the system using different tests.
CO5	Study the conventional method of analyzing digital control systems i
CO6	Study the design of state feedback control by “the pole placement m

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	-	-	-	-	-
CO2	3	3	1	-	1	-
CO3	3	3	1	-	1	-
CO4	1	1	-	-	1	-
CO5	1	2	1	-	-	-
CO6	3	3	3	1	1	-

RT42023C — **SPECIAL ELECTRICAL MACHINES**

CO1	Explain theory of operation and control of switched reluctance moto
CO2	Explain the performance and control of stepper motors, and their ap
CO3	Describe the operation and characteristics of permanent magnet dc
CO4	Distinguish between brush dc motor and brush less dc motor.
CO5	Explain the theory of travelling magnetic field and applications of lin
CO6	Understand the significance of electrical motors for traction drives.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2		1	2	2	
CO2	3	2	1	2	2	
CO3	3	2	2	2	1	
CO4	3	2	1	2	1	
CO5	3	2	2	2	2	
CO6	2	1	1	2	2	

RT42023C — **FLEXIBLE ALTERNATING CURRENT TRANSMISSION SYSTEMS (FACTS)**

CO1	Determine power flow control in transmission lines by using FACTS c
CO2	Explain operation and control of voltage source converter.
CO3	Discuss compensation methods to improve stability and reduce pow
CO4	Explain the method of shunt compensation by using static VAR comp
CO5	Appreciate the methods of compensations by using series compensa
CO6	Explain the operation of modern power electronic controllers (Unifie

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	-	1	1	-
CO2	2	1	-	-	-	-
CO3	2	2	-	-	1	--
CO4	2	2	1	-	1	-
CO5	2	2	1	-	-	-
CO6	3	1	-	-	1	-

RT42024C	AI TECHNIQUES	CO1	Able to study various methods of AI
		CO2	Able to study the models and architecture of artificial neural networ
		CO3	Able to study the ANN paradigms.
		CO4	Able to study the fuzzy sets and operations.
		CO5	Able to study the fuzzy logic systems.
		CO6	Able to study the applications of AI

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2				
CO2	3	2				
CO3	2	3				
CO4	3	3				
CO5	2	2				
CO6	3	3				

	PROJECT	CO1	Able to acquire the requisite skills and to apply the same to a given
		CO2	Able to independently analyse and discuss complex inquiries/proble
		CO3	Able to reflect on, evaluate, and critically assess one's own results ar
		CO4	Able to document and present one's own work for a given target gro
		CO5	Able to identify one's need for updating skills and knowledge and to

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	2			
CO2	2	2	2	2		2
CO3	3	2	3	2	3	2
CO4	2	2	2	2	3	1
CO5	2	2	3	1	2	

JTE OF TECHNOLOGY

ECTRONCIS ENGINEERING

SO MATRIX

EM

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	2	3	3	-	2	2	-
-	1	2	3	-	2	3	2
-	1	3	2	-	2	3	2
-	2	3	2	-	3	2	2
-	1	2	2	-	3	2	2
-	1	2	3	-	2	2	2

plications.

ordinary differential equations using Laplace transforms.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	2	-	-	-	2	-
-	-	2	-	-	-	3	2
-	-	2	-	-	-	-	-
-	-	2	-	-	-	-	2
-	-	1	-	-	-	3	-
-	-	1	-	-	-	2	1

ıods.

al equations.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	1	-	-	-	2	-
-	-	1	-	-	-	3	2
-	-	1	-	-	-	2	2
-	-	3	-	-	-	3	2

-	-	3	-	-	-	2	2
-	-	3	-	-	-	2	2

oblems.
ıysics and conduct experiments.
Acoustics& EM fields.
heory.
iconductor Physics.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	3	-	-	-	-	1	-
-	3	-	-	-	-	1	2
-	2	-	-	-	-	1	2
-	3	-	-	-	-	2	2
-	3	-	-	-	-	3	1
-	3	-	-	-	-	1	1

o the students that is relevant to resolving moral issues in engineering
l concepts to engineering decisions
engineering areas, and to provide an understanding of the interface between social,
in the implementation of the engineering projects.
the budding engineers and make them uncorrupted.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	3	-	-	1	1	2	1
-	2	-	-	3	2	1	2
-	2	-	-	1	1	2	1
-	2	-	-	1	-	-	2
-	3	-	-	1	1	-	1
-	3	-	-	1	1	1	2

ıs curves.
ections.
aight lines.
ohic projections and isometric projections
aphic views to isometric views

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	1	-	-	1	1	-
-	-	1	-	-	1	1	2
-	-	1	-	-	1	1	2
-	-	1	-	-	1	2	2

-	-	1	-	-	1	3	1
-	-	1	-	-	1	1	1

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	3	2	-	2	2	-
-	-	2	2	-	2	3	2
-	-	2	2	-	2	2	2
-	-	2	2	-	3	2	2
-	-	2	2	-	2	2	3
-	-	2	3	-	2	2	2

ence like sound, acceleration &time.
lectrical circuits.

of interference & diffraction.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	1	-	-	-	-	-	1
-	-	-	1	-	-	2	-
-	-	-	1	-	-	1	-
-	-	-	-	-	-	3	2

.
eparations.
ets using proper tin smithytools.

e on assembling and disassembling aPC.

nowledge on basics of internet and worldwide web.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	1	1	-	1	1	-	-
-	1	1	-	-	-	-	-
-	1	1	-	1	1	-	-
-	1	1	-	-	-	-	-
-	-	-	2	-	-	1	1
-	-	1	1	-	-	2	2

-	-	1	1	-	-	1	2
-	-	2	2	1	-	-	-

EM

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	2	3	3	-	2	2	-
-	1	2	3	-	2	3	2
-	1	3	2	-	2	3	2
-	2	3	2	-	3	2	2
-	1	2	2	-	3	2	2
-	1	2	3	-	2	2	2

nt functions.

ations.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	2	-	-	-	2	-
-	-	2	-	-	-	3	2
-	-	2	-	-	-	-	-
-	-	2	-	-	-	-	2
-	-	1	-	-	-	3	-
-	-	1	-	-	-	2	1

ues.

es.

nforced plastics.

on nanotubes, liquid crystals etc.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	2	-	-	-	2	-
-	-	2	-	-	-	3	2
-	-	2	-	-	-	-	-

-	-	2	-	-	-	-	2
-	-	1	-	-	-	3	-
-	-	1	-	-	-	2	1

pplication.

oblems using graphical methods and law of triangle of forces.

of inertia including transfer methods and their applications.

s velocity and acceleration computation and methods of representing plane motion.

udents will acquire ability to apply knowledge of Mechanics.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	2	-	-	-	2	2
-	-	3	-	-	-	2	2
-	-	2	-	-	-	2	2
-	-	3	-	-	-	2	2
-	-	3	-	-	-	3	2
-	-	3	-	-	-	1	1

assive elements.

rameters i.e R, L, C. and f.

rems.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
						3	
						3	1
						2	
					1	3	2
					1	2	3
						1	1

ms in C.

n.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	-	2	-
-	-	-	-	-	-	2	-
-	-	-	-	-	-	2	2

-	-	-	-	-	-	2	2
-	-	-	-	-	-	2	2
-	-	-	-	-	-	2	2

titrations.

er.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
2	-	-	-	-	2	2	2
	-	-	-	-	1	1	-
1	-	-	-	-	1	-	1
-	-	-	-	-	1	-	1
2	-	-	-	-	2	1	2
2	-	-	-	-	2	1	2

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	3	3	-	2	2	-
-	-	2	3	-	2	3	2
-	-	3	2	-	2	2	2
-	-	3	2	-	3	2	2
-	-	2	2	-	3	2	2
-	-	2	3	-	2	2	2

anguage.
ıematical formulae
ımetic, and use the pre-processor

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	-	2	-
-	-	-	-	-	-	2	-
-	-	-	-	-	-	2	-

-	-	-	-	-	-	2	-
-	-	-	-	-	-	2	-
-	-	-	-	-	-	2	-

EM

lition.

ndition.

with different types of excitations.

k parameters.

ven network transfer function.

he response of a electrical network.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	2	2	1
-	-	-	-	-	2	2	1
-	-	-	-	-	1	2	1
-	-	-	-	-	1	2	1
-	-	-	-	-	2	2	1
-	-	-	-	-	1	1	1

gines, evaluation and performance of different systems in IC engines

explain the working principles of impulse & reaction turbines including their efficiencies

d the impact of jet on vanes, explain the working principles of hydraulic pumps including

s governing operation

erent loads by considering various factors

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
2	0	0	0	2	0	3	1
0	0	0	0	2	1	3	1
1	0	0	0	2	1	2	2
0	0	0	0	2	2	2	1
0	0	0	0	2	1	3	1
0	0	0	0	2	1	1	1

o solve theoretical and applied problems.

m.

function,expectations, and distributions of random variables.

ampling distributions.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	2	2	
-	-	-	-	-	3	2	2

2	-	-	-	-	1	2	2
-	-	-	-	-	1	3	2
2	-	-	-	-	2	2	2
-	-	-	-	-	3	2	2

olving Laplace's or Possion's equations.
get's the concept of conduction and convection currents
of ampere's law and the Maxwell's second and third equations.
currents in magnetic field.
y stored in the magnetic field.
calculate induced Emf. Concepts of displacement current and Poynting vector and associated problem

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
						3	
					1	3	2
					1	2	3
					1	2	2
						3	1
1						1	1

d commutation.							
s.							
.							

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
						2	
						3	2
						3	2
						3	2
						3	2
						1	2

or lagging and leading networks.							
s.							
ed loads.							

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1					1	2	2

1					1	2	2
1					1	2	2
2					2	2	2
1					2	2	2

EM
d ecosystems.
t.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
3	2	2	-	-	-	2	-
2	3	2	-	-	-	3	2
2	2	2	-	-	-	-	-
2	2	2	-	-	-	-	2
3	3	1	-	-	-	3	-
2	2	1	-	-	-	2	1

des, able to simplify the logic expressions using Boolean laws and postulates and design
ethod and tabular method.
conventional gates and various PLD's.
LA
ers, MSI Registers and Modes of Operation of Shift Registers, Universal Shift Registers able

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
						3	
					1	3	2
					1	2	3
					1	3	2
					1	2	2
					2	3	3

e RC, RLC circuits
various digital circuits.
d analyze different types of Sampling Gates

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

-	-	-	-	-	2	3	3
-	-	-	-	-	2	3	3
-	-	-	-	-	3	3	2
-	-	-	-	-	1	3	3
-	-	-	-	-	-	2	2
-	-	-	-	-	-	2	2

ower plants.
wer plants.
ms and also estimate voltage drops in both types of distribution systems.
as insulated substations.
ifferent insulating materials.
and diversity factor on the cost of generation of electrical power and also able to identify

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
						3	
					1	3	2
					1	2	3
					1	2	2
						3	1
1						1	1

former.
ansformer.
anging methods and 3-phase to 2-phase transformation.
tion motor.
motor and induction generator.
nduction motors.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
0	0	0	0	0		2	
0	0	0	0	0	1	2	2
0	0	0	0	0	1	2	3
0	0	0	0	0	2	2	2
0	0	0	0	0		2	1
0	0	0	0	0		1	1

nination of overall transfer function using block diagram algebra and signal flow graphs.
r systems and to determine error constants.
ems using Routh's stability criterion and the root locus method.
nse methods.
performance from Bode diagrams.

the response. Understanding the concepts of controllability and observability.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	1	
					1	1	
					1	2	
					1	2	
					1	1	1
					1	2	1

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	1
					1	2	1
					1	2	1
					1	2	1

des

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	1
					1	2	1
					1	2	1
					1	2	1
					1	2	1

EM

of demand like law determinants.

t markets.

s and demerits of both public and private enterprises.

l statements.

o evaluate capital budgeting.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	2	3	2

-	-	-	-	-	2	3	3
-	-	-	-	-	2	3	2
-	-	-	-	-	2	3	3
-	-	2	-	2	2	3	2
-	-	2	-	2	2	3	3

and current for ac and dc.
and energy – able to calibrate energy meter by suitable method
ers
easuring instruments
ing CRO. Able to use digital instruments in electrical measurements.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	3	2
					1	3	1
					1	3	1
					1	1	1
1					1	2	1
2					1	3	1

s for using calculation and behavior during different operating conditions.
and medium type which would have application in medium and high voltage power
in transmission lines. such output will be useful in protecting transmission line insulators
on line for protection of connects equipments,viz.power transformer and system
nsmitting different level of power.
ssion line for safe and efficient performance during operating condition of voltage and

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	2
					1	3	1
					1	1	1
					1	1	1
					1	2	1
					1	3	1

tors.
ngs.
pole synchronous generators.
ed to an infinite bus or when operating in parallel.
torque and power factor correction.
us motor.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	3	2
					1	3	1
					1	3	1
					1	1	1
					1	2	1
					1	3	1

ıd analyze the operation of diode bridge rectifier.
ıntroller and half–wave phase controlled rectifiers.
ʏze harmonics in the input current.
converter.
uency dc–dc converters.
for voltage control and harmonic mitigation.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
0	0	0	0	0	0	3	
0	0	0	0	0	1	3	2
0	0	0	0	0	1	2	3
0	0	0	0	0	1	3	2
0	0	0	0	0	1	2	3
0	0	0	0	0	2	3	2

finitions and Draw and explain the open-loop configuration and feedback configuration
of closed loop voltage gain, the input resistance, the output resistance for Non-Ideal Op-
mic Operations, and Instrumentation Amplifier with relevant Circuits and Design
Operations.
NBPF, Notch Filter, ALL pass filters and Study the operation & applications of PLA.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	3	2
					1	3	1
					1	3	1
					1	1	1
1					1	2	1
					1	3	1

ıction motors.
ırious methods.

e of three–phase synchronous motor.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	1
					1	2	1
					1	2	1
					1	2	1

C and A.C. servo motors and synchronous motors
ag–lead compensators
the transfer function of DC motor

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
		-		-		1	-
		-		1		1	-
		-		-		-	-
		-		1		1	-

ctual properties (IPs) and their roles in contributing to organizational competitiveness.
ual Property.
wnership, scope of protection as well as the ways to create and to extract value from IP.
l sectors for the purposes of product and technology development.
available to the IP owner and describe the precautious steps to be taken to prevent

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
3	-	2	2	2	-	1	2
2	-	2	2	2	-	2	2
2	-	2	2	3	-	1	-
3	-	-	2	2	-	2	3
-	-	2	-	2	-	-	2
-	-	2	2	-	-	2	1

SEM

ation to high voltage circuit breakers of air, oil, vacuum, SF6 gas type.
res of different types of electromagnetic protective relays.
cur in high power generator and transformers and protective schemes used for all protectio
nes used for feeders and bus bar protection.
ew to application in the system.
ing in the system, including existing protective schemes required for insulation co–ordinatio

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

						2	
						3	2
						3	2
						3	2
						3	2
						1	2

nd explore the evalution of microprocessors.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	
					1	2	
					1	1	2
					1	2	2
					1	2	1
					1		2

olications
suitable applications.
nt illuminating sources.
and recommend the most efficient illuminating sources and should be able to design differ
of traction motors.
eration.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	2						
	1	2	1	1	1		
		1		1	1		
1		1	2		1		
2	1		2	2			
		1		2			

d form a Ybus matrix for a power system network with or without mutual couplings.
sing different types of load flow methods and
rovide data for the design of protective devices.
anced power system network.
cepts of a power system.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	2	2				3	
	1	2	1	1	1	3	2
		1		1	1	2	3
1		1	2		1	2	2
2	1		2	2		3	1
		1		2		1	1

ing methods.
s and four quadrant operation of dc motors using dual converters.

voltage controllers and voltage source inverters.
ip power recovery schemes.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
						2	1
						2	1
						2	1
						2	1
						2	1
						2	1

entify various Business Administrative problems.
ntrol charts for testing the efficiency of the production and the quality of the products
chieve their stipulated work targets and the application of the Job Evaluation and Merit
time duration in software development projects and apply the CPM & PERT analysis
ttain the Vision and Mission of the organization. Analyze the organizational strength by
QM and JIT to achieve the quality and benchmarking the standards with improved business

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	-	1	2
-	1	2	1	2	-	2	2
-	-	-	-	-	-	1	2
-	-	2	2	2	-	1	3
-	1	3	2	2	-	1	3
-	-	-	-	-	-	1	1

and analyze gate drive circuits of IGBT.
l wave bridge converters with both resistive and inductive loads.
or with resistive and inductive loads.
singlephase square wave inverter and PWM inverter.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
		1					
		1					
		1					
		1					

current, power, energy and electrical characteristics of resistance, inductance and

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	
						1	

EM

earth's surface.

ratio.

and geothermal systems.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1		
					1		
					2		
					2		
					1		
					1		

ower handling capacity, losses, conductor resistance and electrostatic field associate with
e noise generation and frequency spectrum for single and three phase transmission lines.
h regard to terminal equipments, type of HVDC connectivity and planning of HVDC system.
version, control characteristic, firing angle control and effect of source impedance.
nal control, filters and reactive power compensation in AC. side of HVDC system.
s for six and twelve pulse conversion.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

						1	1
						1	1
						1	1
						1	1

a systems.

n.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	1
						2	1
					1	2	1
						2	1
					1	2	1
					1	2	1

ocity, temperature, pressure etc.

digital voltmeters.

gnal with the help of CRO.

analyzers.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	1
					2	1	2
					1	-	1
					-	2	2
					-	1	1
					1	2	3

performance.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
						2	
						3	2
						3	2
						3	2
						3	2
						1	2

ning of microprocessor.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	1	
					1	1	1
					1	1	

erter, Buck converter, full convertor and PWM inverter.
nsformer models.
connected to infinite bus (SMIB).
con–Rampson method.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
		1					2
		1					2
		1					1
		1					1

l dispatch centre.
components.
ents.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
		1					2
		1					2
		1					1
		1					1

SEM
rious components associated with it. Advantages compared to the analog type.
al analysis of digital control systems.

uation of state transition matrix.

n the w–plane.

nethod."

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	1	2	2
-	-	-	-	-	1	3	1
-	-	-	-	-	1	3	1
-	-	-	-	-	1	1	1
1		-	-	-	1	2	1
2	-	-	-	-	1	2	1

r.

plications.

motor.

ear motors.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1		1
					1		1
					1		1
					1		1
					1		1
					1		1

ontrollers.

er oscillations in the transmission lines.

pensators.

ators.

ed Power Quality Conditioner and Interline Power Flow Controller).

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	1	2	1
-	--	-	-	-	2	1	2
-	-	-	-	-	1	1	2
-	-	-	-	-	-	2	1
-	-	-	-	-	-	2	1
-	-	-	-	-	1	2	3

ks.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1		2
					1		2
					2		2
					2		2
					2		2
					2		2

problem in the relevant technical area.
ms within the given constraints and handle larger problems at an advanced level within
nd correlate it with other scientific results.
up, with strict requirements on structure, format and language usage.
o continuously develop one's own competencies

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
		2				3	
		2		3	1	2	2
		3		2	1	2	3
		3		3	1	2	2
		2		2	1	3	1

s are solved.