

(AUTONOMOUS)

I M.TECH I Semester Regular Examinations, January-2025

Sub Code: R24MCC101

RESEARCH METHODOLOGY & IPR

Max. Marks: 60

R24

Time: 3 hours

(MD,CSE, STRE, PID, DECS, VLSI&ES)

Note: Answer All **FIVE** Questions.

O Nio	1	All Questions Carry Equal Marks (5 X 12M = 60M) Questions	KL	CO	M
Q.No		Unit-I			
		i) Explain Clearly the objectives of Research Problem	K2	1	6M
1	a	ii) Interpret different sources of research problem by giving suitable examples	K2	1	6M
		OR			
	b	i) Explain clearly research design process and steps to be followed	K2	1	12M
		Unit-II			
		i) How do you design a research problem? Give an example to illustrate your answer	K2	2	6M
2	a	ii) Discuss various issues involved in selecting a research problem. Also elaborate important features of a good research design.	K2	2	6M
		OR	L		1
		i) Differentiate between qualitative research and quantitative research	K2	2	12M
	b	Unit-III	<u> </u>	1	
		i) Explain the procedure to determine the size of sample and discuss on sampling size	K2	3	6M
3	a	ii) Explain the Concepts of Statistical Population	K2	3	6M
			.,	· p	
	b	Explain different types of sampling techniques	K2	3	12M
	1	Unit-IV		·	
		i) Explain new developments in Intellectual Property Rights.	K2	4	6M
	a	ii) Define intellectual property in research. Explain different types of intellectual property	K2	4	6M
4	-	OR			
	-	i) Contrast the purpose and functions of trademarks	K2	4	6M
	Ъ	ii) Write notes on trade secrets, precautions and maintenance	K2	4	6M
	-	Unit-V	<u></u>	,l	
		i) Exemplify the basic criteria of patentability of industrial designs	K2	5	6M
	a	ii) Explain the fundamentals of copyright laws	K2	5	6M
5		OR			- 1
		i) Describe briefly how the online patent data is organized	K3	5	6M
	Ъ	ii) Describe the structure and content of a patent document in general.	K3	5	6M

KL: Blooms Taxonomy Knowledge Level

CO: Course Outcome M: Marks

1



I M. Tech I Semester Regular Examinations, January-2025

Sub Code: R24MNC102

DISASTER MANAGEMENT

Time: 3 hours

(STRE, P&ID, MD,DECS,VLSI&ES and CSE) Note: Answer All **FIVE** Questions. Max. Marks: 60

All Questions Carry Equal	1 Marks (5 X 12 = 60 M)

Q.No		All Questions Carry Equal Marks (5 X 12 = 60M) Questions	KL	CO				
Q.I to	!	Unit-I						
		i) Describe types of disasters with examples.	K2&K3	C01	6M			
	a	ii)) Explain About The Disaster Management Cycle	K2&K3	C01	6M			
		OR		<u> </u>				
1		i) Explain how the Richter scale is used to measure the magnitude of an	K2&K3	C01	6M			
		earthquake			OIVI			
	b	ii) Discuss various types of natural disasters in India and highlight their	K2&K3	C01	CN (
		effects			6M			
		Unit-II			,			
	a	Explain The causes of Floods and the effects of Floods in detail. Give one Case Study of The Floods.	K2&K3	C02	12M			
2		OR						
	1.	Explain The causes of earthquakes and effects of earthquakes in detail.	K2&K3	C02	12M			
	b	Give one Case Study of The earthquake.			12101			
		Unit-III						
		i) Explain the Earthquake zones of India	K2&K3	C03	6M			
3	a	ii) explain assessing risk and vulnerability	K2&K3	C03	6M			
	OR							
		What is drought? Explain the types of droughts. Explain drought		C03	403.5			
	b	mitigation with an integration of technology and people.			12M			
		Unit-IV						
.	a	i) what are the multimedia technologies of disaster risk management in remote sensing	K2&K3	C04	12M			
4		OR		<u> </u>				
4	b	i) what are the forewarning levels of disaster management	K2&K3	C04	6M			
		ii) Explain About The Mass Media and disaster	K2&K3	C04	6M			
		Management? Unit-V		J				
	-	i) what are the disaster management acts and policies in India	K2&K3	C05	6M			
	a	ii) What are the steps for formulating a disaster risk reduction plan?	K2&K3	C05	6M			
5		OR	<u> </u>	<u> </u>	0171			
		What are favourable conditions for cyclone formation? How do you estimate risk from cyclonic conditions and safety precautions to save lives?	K2&K3	C05	12M			



(AUTONOMOUS)

I M.TECH I Semester Regular Examinations, January-2025

Sub Code: R24MPI102 ELECTRICAL MACHINE MODELLING AND ANALYSIS

Time: 3 hours (EEE)

Max. Marks: 60

Note: Answer All FIVE Questions. All Questions Carry Equal Marks (5 X 12M = 60M) Q.No **Ouestions** KL CO M Unit-I i)Explain the modeling of basic 2 pole machine with necessary equations? 2 1 6M ii)Describe the modeling of three phase synchronous machine with damper a 2 1 6M bars? 1 OR Explain the Kron's primitive machine with relevant relations? i) 1 6M Describe the modeling of three phase synchronous machine ii) b $\overline{2}$ 1 6M without damper bars? Unit-II Derive the transfer function of separately excited DC motors? i) 3 2 бМ a Derive and analyze the mathematical model of D.C shunt motor? ii) $\overline{3}$ 2 **6M** 2 OR Derive and analyze the mathematical model of D.C series motor? i) 3 2 **6M** b Derive the state variable form of DC compound motor? ii) 3 2 6M Unit-III Explain in detail about the process and outcomes of linear i) 2 6M transformation? a Derive and analyze the circuit model of three phase induction motor? ii) 4 3 6М 3 OR Explain in detail about the process and outcomes of phase i) 2 3 6M b transformation? ii) Analyze the two axis models of induction motors? 3 3 6M Unit-IV Write and explain the importance of small signal equations of i) 2 4 6М induction machines? a Describe the cross field theory of single phase induction machine ii) 3 4 with necessary equations? бΜ 4 OR i)Describe the signal flow graph representation of 3 4 induction machines? **6**M b ii) Explain the steady state analysis of single phase induction machines 2 4 **6M** with necessary equations? Unit-V Discuss in detail about the importance of synchronous machine i) 2 5 6M inductances? a Explain the phase coordinate model of synchronous machine with ii) 2 5 necessary equations? 6M 5 OR Derive and analyze the mathematical model of PM synchronous i) 3 5 motor? 6M b Explain the space phasor model of synchronous machine with ii) $\overline{2}$ 5 necessary equations? бΜ



I M.TECH I Semester Regular Examinations, January-2025

Sub Code: R24MPI103 ANALYSIS OF POWER ELECTRONIC CONVERTERS AND INVERTERS

Time: 3 hours

(P&ID)

Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks ((5	X	12M	=	60M)_
-----------------------------------	----	---	-----	---	-----	----

			All Questions Carry Equal Marks (5 X 12M = 60M)		1 00 1					
Q.No			Questions	KL	CO	M				
			Unit-I		T - T					
		i)	Explain about the half controlled converter with freewheeling	2	1	6M				
	a		diode by drawing output waveforms?							
	a	ii)	Summarize the performance parameters of dual converter and	3	1	6M				
1			write their importance?		<u> </u>					
			OR		1					
		i)	Explain about the fully controlled converter with freewheeling	2	1	6M				
	b -		diode by drawing output waveforms?							
	ן ט	ii)	Draw the circuit diagram and explain the working principle of	3	$\begin{vmatrix} 1 \end{vmatrix}$	6N				
			dual converter?							
			Unit-II							
		i)	Explain the three phase AC-DC fully controlled converter with	2	2	6N				
			resistive load?			- 011				
	a -	ii)	Analyze the operation of three phase inverter with circuit	4	2	6N				
•			diagram?			017				
2			OR							
		i)	Explain the three phase AC-DC semi controlled converter with	2	2	6N				
	.	,	resistive load?			OIV				
	b -	ii)	Explain the effect of source impedance on three phase inverter	2	2	6N				
		ĺ	operation?	i		Oiv				
	Unit-III									
		i)	Explain in detail about design of buck boost converter with	3	3	6N				
	a	-,	necessary equations?			l Oly				
	"	ii)	Draw the circuit diagram and explain the resonant converters?	3	3	6N				
3			OR			•				
	— —	i)	Explain in detail about design of CUK converter with necessary	3	3					
		-)	equations?			61				
	b -	ii)	Draw the circuit diagram and explain the quasi resonant	3	3	61				
		~~)	converters?			6N				
	<u> </u>		Unit-IV	· · · · · · · · · · · · · · · · · · ·						
		i)	Describe the operation of full bridge inverter with output	3	4					
	. !	1)	waveforms?			61				
	a -	ii)	Justify the voltage control three phase inverters by using PWM	4	4					
		11)	techniques?			61				
4		. .	OR OR	1						
	 	<u> </u>		3	4					
		i)	Describe the operation of half bridge inverter with			61				
			output waveforms?			1				
	h									
	b	ii)	Compare the 180° and 120° conduction modes of operation of	4	4	61				

1	L		Umit- v			
	a	i)	Analyze the AC voltage controllers with RL load and draw the output waveforms?	4	5	6M
5	a	ii)	Draw the circuit diagram and explain the three phase cyclo converters?	2	5	6M
			OR	L	!	<u> </u>
	b	i)	Analyze the AC voltage controllers with R load and draw the output waveforms?	3	5	6M
		ii)	Draw the circuit diagram and explain the single phase cyclo converters?	2	5	6M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M: Marks



I M.TECH I Semester Regular Examinations, January-2025 Sub Code: R24MPI104 POWER SEMICONDUCTOR DEVICES AND PROTECTION

R24

Time: 3 hours Note: Answer All FIVE Questions. All Questions Carry Equal Marks (5 X 12M = 60M) Questions Note: Answer All FIVE Questions. All Questions Carry Equal Marks (5 X 12M = 60M) Questions		1	(P&ID) Max. M	arks: 6	0	
Q.No Comparison	Time: 3	Mo	to Anguar All FIVE Questions, All Ouestions Carry Equal Marks (5 X 12M = 60M)			127
i) Classify different uncontrolled and controlled power semiconductor devices. ii) Explain in detail about the I-V characteristics of Ideal switches and practical switches. OR i) Classify and briefly explain the power switching devices. b ii) Draw and explain the V-I characteristics of BIT, MOSFET and IGBT and practical conditions. Unit-II i) Classify different types of power diodes. ii) Draw the reverse recovery characteristics of a power diode and explain how a device can regain its blocking capability by deriving the expression for reverse recovery time OR i) Explain the operational difference between line frequency and fast recovery diodes. ii) Discuss the switching characteristics of power transistor with a neat sketch and list out the advantages. Unit-III a ii) Draw and explain the switching characteristics of MOSFET. b iii) Describe the process of on to off state transitions of IGBT. OR ii) Mention different methods to drive the MOSFETs. iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Characteristics of IGBTs. CR iii) Draw and explain the V-I Char	0.110	110	Questions Questions	KL	CO	IM
a devices. ii) Explain in detail about the I-V characteristics of Ideal switches and K3 1 8M practical switches. OR i) Classify and briefly explain the power switching devices. b ii) Draw and explain the V-I characteristics of BJT, MOSFET and IGBT with a moder ideal and practical conditions. Unit-II i) Classify different types of power diodes. ii) Draw the reverse recovery characteristics of a power diode and explain how a device can regain its blocking capability by deriving the expression for reverse recovery time OR i) Explain the operational difference between line frequency and fast K2 2 6M recovery diodes. b ii) Discuss the switching characteristics of power transistor with a neat K2 2 6M sketch and list out the advantages. Unit-III a ii) Draw and explain the switching characteristics of MOSFET. K2 3 5M OR b ii) Describe the process of on to off state transitions of IGBT. OR b ii) Mention different methods to drive the MOSFETS. K2 3 5M OR Unit-IV a ii) Explain dv/dt protection for power semiconductor devices. K2 4 6M or OR ii) Draw and explain the V-I Characteristics of IGBTs. K2 3 7M or Unit-IV a ii) Explain dv/dt protection for power semiconductor devices. K2 4 6M or OR ii) Describe how power semiconductor devices. K2 4 6M or OR ii) Describe how power semiconductor devices are protected against over K2 5 6M or Currents. ii) Design a snubber circuit for any power device. K3 4 6M or Currents. ii) Design a snubber circuit for any power device. K3 5 6M or Currents. ii) Explain how conduction and transition losses are computed in power converters? ii) Explain how conduction and transition losses are computed in power K2 5 6M or Section ii) Explain the electrical equivalent circuit of the thermal model with a neat skcto. OR ii) Explain the electrical equivalent circuit of the thermal model with a neat skcto. OR	Q.NO					
ii) Explain in detail about the I-V characteristics of Ideal switches and practical switches. OR i) Classify and briefly explain the power switching devices. ii) Draw and explain the V-I characteristics of BIT, MOSFET and IGBT (MOSFET and IGBT) (MOSFET and IGBT				K2	1	4M
1) Classify and briefly explain the power switching devices. K2 1 4M		a -	ii) Explain in detail about the I-V characteristics of Ideal switches and	К3	1	8M
b i) Classify and briefly explain the power switching devices. b ii) Draw and explain the V-I characteristics of BJT, MOSFET and IGBT (K3 1 8M) Unit-II	1		practical switches.			
1) Classify and briefly explain the power swinding corrects 1i) Draw and explain the V-I characteristics of BJT, MOSFET and IGBT under ideal and practical conditions.				K2	1	4M
under ideal and practical conditions. Unit-II			i) Classify and briefly explain the power switching devices.		1	
1) Classify different types of power diodes. K2 2 4M a ii) Classify different types of power diodes. K3 2 a ii) Draw the reverse recovery characteristics of a power diode and explain how a device can regain its blocking capability by deriving the expression for reverse recovery time		b	ii) Draw and explain the V-I characteristics of BJ1, WOSIE1 and IGB1	220		8M
3 Olassify different types of power diodes. ii) Draw the reverse recovery characteristics of a power diode and explain how a device can regain its blocking capability by deriving the expression for reverse recovery time OR			under ideal and practical conditions.		11	
a i) Classify different types of power diodes. ii) Draw the reverse recovery characteristics of a power diode and explain how a device can regain its blocking capability by deriving the expression for reverse recovery time OR i) Explain the operational difference between line frequency and fast K2 2 6M recovery diodes. iii) Discuss the switching characteristics of power transistor with a neat K2 2 6M sketch and list out the advantages. Unit-III a ii) Draw and explain the switching characteristics of MOSFET. K2 3 7M iii) Draw and explain the switching characteristics of IGBT. K2 3 5M OR b ii) Mention different methods to drive the MOSFETs. K2 3 7M IIII-III a iii) Draw and explain the V-I Characteristics of IGBTs. K2 3 7M OR b iii) Draw and explain the V-I Characteristics of IGBTs. K2 3 7M IIII-III-III-III-III-III-III-III-III-I				K2	2	4M
a how a device can regain its blocking capability by deriving the expression			i) Classify different types of power diodes.			
a how a device can regain its blocking capability by deriving the explession			ii) Draw the reverse recovery characteristics of a power diode and explain	KJ	2	8M
Separate For reverse recovery time OR		a	how a device can regain its blocking capability by deriving the expression	l		0111
i) Explain the operational difference between line frequency and fast K2 2 6M recovery diodes. ii) Discuss the switching characteristics of power transistor with a neat K2 2 6M sketch and list out the advantages. Unit-III i) Draw and explain the switching characteristics of MOSFET. K2 3 7M ii) Describe the process of on to off state transitions of IGBT. K2 3 5M OR i) Mention different methods to drive the MOSFETs. K2 3 5M ii) Draw and explain the V-I Characteristics of IGBTs. K2 3 7M Unit-IV a i) Explain dv/dt protection for power semiconductor devices. K2 4 6M ii) What is snubber circuit? Why it is needed in Power converters? K3 4 6M ourrents. ii) Describe how power semiconductor devices are protected against over currents. ii) Design a snubber circuit for any power device. K3 4 6M ii) Design a snubber circuit for any power device. K3 4 6M ii) Explain how conduction and transition losses are computed in power K2 5 6M devices? ii) Explain the electrical equivalent circuit of the thermal model with a neat K3 5 6M ii) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M iii) Discuss the design of high frequency inductors and transformers. K3 5 6M			for reverse recovery time	<u> </u>	<u></u>	
b recovery diodes. ii) Discuss the switching characteristics of power transistor with a neat sketch and list out the advantages. Unit-III a i) Draw and explain the switching characteristics of MOSFET. K2 3 7M. ii) Describe the process of on to off state transitions of IGBT. K2 3 5M. OR b i) Mention different methods to drive the MOSFETs. K2 3 7M. Unit-IV a i) Explain dv/dt protection for power semiconductor devices. K2 4 6M. ii) What is snubber circuit? Why it is needed in Power converters? K3 4 6M. OR i) Describe how power semiconductor devices are protected against over Currents. ii) Design a snubber circuit for any power device. K3 4 6M. Unit-V i) Explain how conduction and transition losses are computed in power K2 5 6M. devices? ii) Explain the electrical equivalent circuit of the thermal model with a neat k3 5 6M. b ii) What is the significance of heat sing? And explain its sizing. K3 5 6M. ii) Discuss the design of high frequency inductors and transformers. K3 5 6M.	2		OR	TZO	T 2	
ii) Discuss the switching characteristics of power transistor with a neat sketch and list out the advantages. Unit-III a i) Draw and explain the switching characteristics of MOSFET. K2 3 7M. ii) Describe the process of on to off state transitions of IGBT. K2 3 5M OR b i) Mention different methods to drive the MOSFETs. K2 3 7M. ii) Draw and explain the V-I Characteristics of IGBTs. K2 3 7M. Unit-IV a i) Explain dv/dt protection for power semiconductor devices. K2 4 6M. ii) What is snubber circuit? Why it is needed in Power converters? K3 4 6M. OR i) Describe how power semiconductor devices are protected against over currents. ii) Design a snubber circuit for any power device. K3 4 6M. ii) Design a snubber circuit for any power device. K3 4 6M. ii) Explain how conduction and transition losses are computed in power K2 5 6M. devices? ii) Explain the electrical equivalent circuit of the thermal model with a neat sketch. OR b i) What is the significance of heat sing? And explain its sizing. K3 5 6M. ii) Discuss the design of high frequency inductors and transformers. K3 5 6M.		b		K2	2	6M
sketch and list out the advantages. Unit-III a i) Draw and explain the switching characteristics of MOSFET. K2 3 5M ii) Describe the process of on to off state transitions of IGBT. K2 3 5M OR b i) Mention different methods to drive the MOSFETs. K2 3 5M ii) Draw and explain the V-I Characteristics of IGBTs. K2 3 7M ii) Draw and explain the V-I Characteristics of IGBTs. K2 3 7M III-IV a i) Explain dv/dt protection for power semiconductor devices. K2 4 6M ii) What is snubber circuit? Why it is needed in Power converters? K3 4 6M OR OR i) Describe how power semiconductor devices are protected against over currents. ii) Design a snubber circuit for any power device. K3 4 6M Unit-V i)Explain how conduction and transition losses are computed in power K2 5 6M devices? ii) Explain the electrical equivalent circuit of the thermal model with a neat sketch. OR b i) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M			recovery diodes.	K2	2	GM
Unit-III a i) Draw and explain the switching characteristics of MOSFET. K2 3 7M ii) Describe the process of on to off state transitions of IGBT. K2 3 5M OR	1		11) Discuss the switching characteristics of power characteristics of power characteristics of power characteristics.			Olvi
a i) Draw and explain the switching characteristics of MOSFET. K2 3 7M ii) Describe the process of on to off state transitions of IGBT. By ii) Mention different methods to drive the MOSFETS. K2 3 5M ii) Draw and explain the V-I Characteristics of IGBTs. K2 3 7M Unit-IV Variable	<u></u>		sketch and list out the advantages.			
a ii) Describe the process of on to off state transitions of IGB1. b i) Mention different methods to drive the MOSFETs.				K2	3	7M
1 1 1 1 1 1 1 1 1 1	1	a	i) Draw and explain the switching characteristics of Moor 21.	K2	3	5M
b i) Mention different methods to drive the MOSFETs. K2 3 5M ii) Draw and explain the V-I Characteristics of IGBTs. K2 3 7M Unit-IV	2		ii) Describe the process of on to oil state transitions of 1GD1:	1		.t
b i) Mention different methods to drive the MOSTETS. ii) Draw and explain the V-I Characteristics of IGBTs. Unit-IV a i) Explain dv/dt protection for power semiconductor devices. ii) What is snubber circuit? Why it is needed in Power converters? K2 4 6M OR OR i) Describe how power semiconductor devices are protected against over currents. ii) Design a snubber circuit for any power device. K3 4 6M Unit-V i) Explain how conduction and transition losses are computed in power devices? ii) Explain the electrical equivalent circuit of the thermal model with a neat sketch. OR i) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M				K2	3	5M
4 i) Draw and explain the V-I Characteristics of RODIs. Unit-IV		h	i) Mention different methods to drive the MOSPETS.			
a i) Explain dv/dt protection for power semiconductor devices. ii) What is snubber circuit? Why it is needed in Power converters? OR ii) Describe how power semiconductor devices are protected against over currents. ii) Design a snubber circuit for any power device. K2 4 6M K2 4 6M 6M Currents. ii) Design a snubber circuit for any power device. K3 4 6M Currents. ii) Explain how conduction and transition losses are computed in power devices? iii) Explain the electrical equivalent circuit of the thermal model with a neat sketch. OR b i) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M	<u> </u>	D	ii) Draw and explain the V-I Characteristics of IGB1s.	1 112		1 / 2
a i) Explain dv/dt protection for power semiconductor devices. ii) What is snubber circuit? Why it is needed in Power converters? OR i) Describe how power semiconductor devices are protected against over currents. ii) Design a snubber circuit for any power device. K2 4 6M Unit-V ii) Explain how conduction and transition losses are computed in power devices? ii) Explain the electrical equivalent circuit of the thermal model with a neat k3 5 6M sketch. OR ii) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M				K2	T 4	6M
ii) Describe how power semiconductor devices are protected against over currents. ii) Design a snubber circuit for any power device. Unit-V ii) Explain how conduction and transition losses are computed in power devices? iii) Explain the electrical equivalent circuit of the thermal model with a neat sketch. OR ii) What is the significance of heat sing? And explain its sizing. iii) What is the significance of high frequency inductors and transformers. K2 4 6M K3 4 6M CM CM CM CM CM CM CM CM CM			i) Explain dv/dt protection for power semiconductor devices.			
i) Describe how power semiconductor devices are protected against over currents. ii) Design a snubber circuit for any power device. Unit-V ii) Explain how conduction and transition losses are computed in power devices? ii) Explain the electrical equivalent circuit of the thermal model with a neat sketch. OR b i) What is the significance of heat sing? And explain its sizing. K2 4 6M		a	ii) What is snubber circuit? Why it is needed in Power conveners?	1 K2	1 7	CIVI
i) Describe how power semiconductor devices are protected against over ii) Design a snubber circuit for any power device. Unit-V i)Explain how conduction and transition losses are computed in power devices? ii) Explain the electrical equivalent circuit of the thermal model with a neat K3 5 6M sketch. OR i) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M	1			1 772		1
b currents. ii) Design a snubber circuit for any power device. Unit-V ii) Explain how conduction and transition losses are computed in power k2 5 6M devices? ii) Explain the electrical equivalent circuit of the thermal model with a neat k3 5 6M sketch. OR i) What is the significance of heat sing? And explain its sizing. k3 5 6M ii) Discuss the design of high frequency inductors and transformers. k3 5 6M	4		i) Describe how power semiconductor devices are protected against over	1,52	4	6M
ii) Design a snubber circuit for any power device. Unit-V i)Explain how conduction and transition losses are computed in power K2 5 6M devices? ii) Explain the electrical equivalent circuit of the thermal model with a neat K3 5 6M sketch. OR i) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M	į	h				ONI
Unit-V i) Explain how conduction and transition losses are computed in power K2 5 6M devices? ii) Explain the electrical equivalent circuit of the thermal model with a neat K3 5 6M sketch. OR b i) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M		D		K3	4	6M
i)Explain how conduction and transition losses are computed in power a devices? ii) Explain the electrical equivalent circuit of the thermal model with a neat K3 5 6M sketch. OR b i) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M			ii) Design a snubber circuit for any power device.	1 120		
a devices? ii) Explain the electrical equivalent circuit of the thermal model with a neat K3 5 6M sketch. OR b i) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M				 	5	1
a ii) Explain the electrical equivalent circuit of the thermal model with a neat K3 5 6M sketch. OR i) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M				IX2		6M
sketch. OR i) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M		١,	devices?	+ K3	- 5	
b i) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M	;	a	ii) Explain the electrical equivalent circuit of the thermal model with a near	t KS	' '	6М
b i) What is the significance of heat sing? And explain its sizing. K3 5 6M ii) Discuss the design of high frequency inductors and transformers. K3 5 6M	5					
b ii) Discuss the design of high frequency inductors and transformers. K3 5 6M				17.0	2 =	LT.K
ii) Discuss the design of high frequency inductors and transformers.			i) What is the significance of heat sing? And explain its sizing.			
			ii) Discuss the design of high frequency inductors and transformers.	K.) 3	OTAT

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M:Marks



(AUTONOMOUS)

I M.TECH I Semester Regular $\mathbb E$ xaminations, January-2025

Sub Code: R24MPI109

SPECIAL MACHINES AND CONTROL

Max. Marks: 60

R24

Time: 3 hours

(P&ID) Max. M

EIVE Questions All Questions Carry Equal Marks (5 X 12M = 60M)

Time: 3	, 110a	A All DISTE Oversions All Oversions Cover Equal Marks (E.Y. 12M = 60M)			
ON	N	ote: Answer All FIVE Questions. All Questions Carry Equal Marks (5 X 12M = 60M) Questions	KL	CO	M
Q.No_		Unit-I		001	
	ļ		K3	1	
		i) Compare the static and dynamic characteristics of stepper motor with	173	*	6M
•	a	necessary diagrams.	K2	1	
•		ii) Explain the construction of multi stack Variable reluctance stepper motor	182		6M
1		with neat sketches.			
_		OR	K3	1 1	
		i) Calculate the stator pole pitch, rotor pole pitch and full step angle of a	K	1	6M
	Ъ	12/8 Variable reluctance stepper motor.	K2	1	
		ii) Draw the block diagram and explain the open-loop control of stepper a	K2	1 1	6M
		motor.		<u>l </u>	
		Unit-II	1/2	1 7	
		What is the reason for torque ripples in switched reluctance motors? With a	К3	2	12M
	a	block diagram, explain in detail the torque control of a switched reluctance			1 2111
		motor.			
2	L	OR	TZO		
	ļ	i) Explain the construction and working principle of switched reluctance	K2	2	6M
	ь	motor.	TZO		
•	"	ii) List the advantages, disadvantages and applications of switched	K2	2	6M
		reluctance motors.			
		Unit-III		1 0	
		What is a commutator? What is its need in electrical machines? Compare	К3	3	12M
	a	between mechanical and electronic commutators.		<u></u>	<u> </u>
3		OR		1 6	
		i) Explain the closed loop control scheme of a PMBLDC motor drive with a	K3	3	-6M
	b	suitable schematic diagram.		 _	- (3.5
		ii) Explain about Square wave permanent magnet brushless motor drives.	<u>K2</u>	3	6M
		Unit-IV			
		i) Discuss the constructional differences between permanent magnet	K2	4	6M
		synchronous motor and BLDC motors.		 	
l.	a	ii) Discuss different types of rotors in permanent magnet synchronous	K2	4	6M
		machines.			<u> </u>
4		OR		-1 -2	1
•		i) Draw and discuss the Torque-speed characteristics of permanent	K2	4	6M
		magnet synchronous motor.			OIAT
	b	ii) Discuss the Vector control scheme of permanent magnet synchronous	K2	4	
		motor in detail.		'	6M
5		motor in detail. Unit-V	<u> </u>	_ !	1:
)		i) Compare between stepper motors and servo motors.	K3	5	6M
	a	ii) Explain about microprocessor control of a servo motor.	K2	5	6M
	-	OR	1		
1	<u> </u> -	CAGALL with a rest schematic	K3	5	12M
	b	Explain the operating principle of AC tachometers	123		12.17
L		diagram. Also discuss the applications of AC tachometers.			J