



S J P N Trust's
Hirasugar Institute of Technology, Nidasoshi

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Accredited at 'A' Grade by NAAC
Programmes Accredited by NBA: CSE, ECE, EEE & ME.

ECE Dept. 3
Exam.
Internal Assessment
Odd Sem(2019-20)

FIRST INTERNAL ASSESSMENT

Sem: VII
Date: 16/09/2019


Sub: Power Electronics
Time: 11.00AM-12.00 NOON


Sub. Code: 15EC73
Max. Marks:25

Note: Answer two full questions, draw sketches wherever necessary.

Q. No	Description of Question	Marks	CO	RBT LEVEL	
1	a	What is power electronics? Explain with block diagram. Mention its industrial applications.	6	CO403.1	L2
	b	A power BJT connected as a switch has following parameters: $\beta=8$ to 45, $V_{CE(sat)}=1.0V$, $R_C=11\Omega$, $V_{CC}=200V$, $V_B=10V$ & $V_{BE(sat)}=1.5V$, compute (i) the value R_B with $ODF=5$, (ii) the value of β_{forced} and (iii) the power dissipated P_T in the transistor.	7	CO403.1	L2
OR					
2	a	Explain the peripheral effects caused by power electronic converters.	6	CO403.1	L2
	b	Describe the switching characteristics of a BJT with the help of its equivalent circuit and waveforms.	7	CO403.1	L2
3	a	Explain DC-DC and DC-AC type power converter and mention the nature of input and output power in each case.	6	CO403.1	L2
	b	Compare BJT and MOSFET.	6	CO403.1	L2
OR					
4	a	Explain AC-DC and AC-AC type power converter and mention the nature of input and output power in each case.	6	CO403.1	L3
	b	Draw symbol and VI characteristics of i) LASCR, ii) TRIAC & iii) IGBT	6	CO403.1	L2


Course Coordinator
Prof. D.M.Kumbhar


Module Coordinator
Prof. S.B.Akkole


HOD
Dr. V.G.Kasbegoudar

IA - 1 SCHEME OF EVALUATION

Sem : 7		Subject : Power Electronics	Sub Code : 15EC73	Date : 16/09/19.		
Q. No.	Bit	Description	Marks	CO's	RBT Level	
1.	a.	Power Electronics. Defn Block Dia & explanation Applications.	1 3 2	(0403.1)	L2.	
	b.	$I_{CS} = 15.09 \text{ A} = \frac{V_{CE} - V_{CE(sat)}}{R_C}$ $I_{BS} = 2.26 \text{ A} = \frac{I_{CS}}{\beta_{min}}$ $I_B = ODF \times I_{BS} = 11.3 \text{ A}.$ $R_B = \frac{V_B - V_{BE(sat)}}{I_B} = 0.751 \Omega.$ $\beta_{forced} = \frac{I_{CS}}{I_B} = 1.6.$ $P_T = V_{BE(sat)} I_B + I_{CS} V_{CE(sat)}$ $= 25.04 \text{ watt}$	1 1 1 1 1	(0403.1)	L4.	
2.	a.	Peripheral Effects. Block Dia of power electronics with Bip & op filters. Effects - Harmonic, Distortion, Interference, noise, voltage & current spikes.	2 4.			

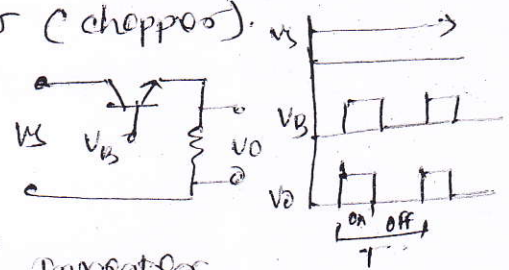
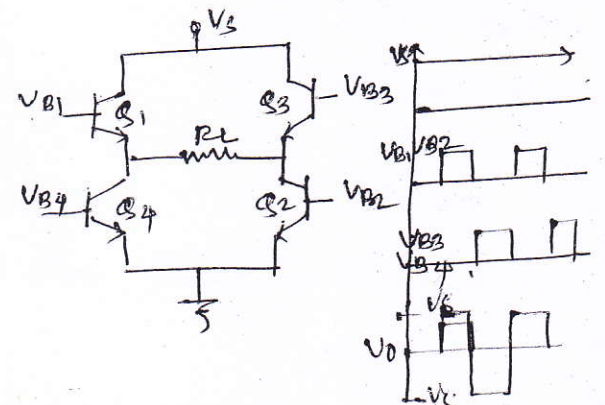
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IA - I SCHEME OF EVALUATION

Sem :	7	Subject :	PE	Sub Code :	ISEL73	Date :	16/09/19	
Q. No.	Bit	Description				Marks	CO's	RBT Level
2.	b.	Switching characteristics of BJT. Waveforms of V_B, I_B, I_C, V_{CE} showing $t_d, t_r, t_{on}, t_{off}, t_s, t_f, t_c, t_{off}$. Explanation of time periods. $t_d, t_r, t_{on} = t_d + t_r$ $t_s, t_f, t_{off} = t_s + t_f$				3	CO 403.1	L2
3.	a.	DC-DC converter (chopper). Circuit Diagram Waveforms Explanation 				3		
	b.	DC-DC converter Inverter Circuit Dia Waveforms Explanation 				3		

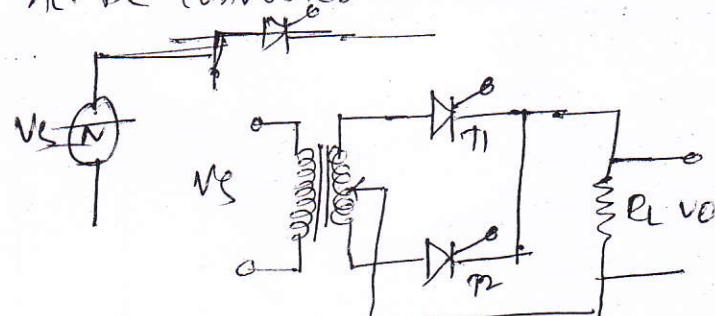
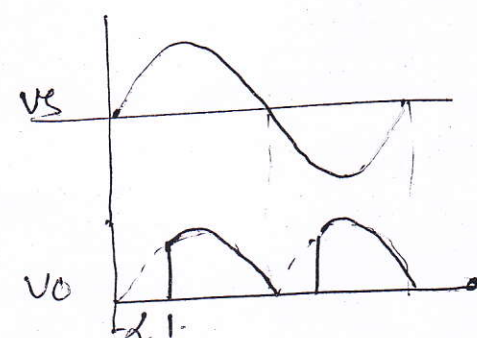
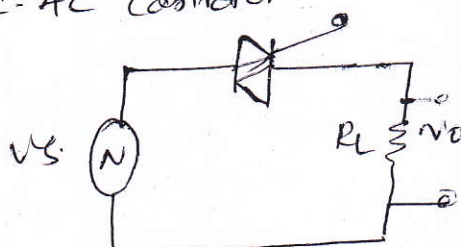
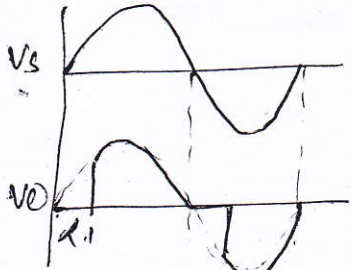
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IA - I SCHEME OF EVALUATION

Sem :	7	Subject :	PE	Sub Code :	ISEC73	Date :	16/09/19		
Q. No.	Bit	Description				Marks	CO's	RBT Level	
3	b.	Comparison bet ⁿ BJT & MOSFET Give at least 6 comparison points.				6	CO3	L2.	
4.	a.	AC-DC converter  Circuit Dia				1	CO4	L2	
		 Waveforms				1			
		Explanation -							
	b.	AC-AC converter 				3			
									

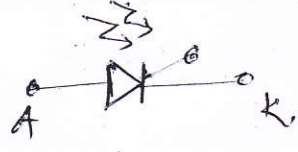
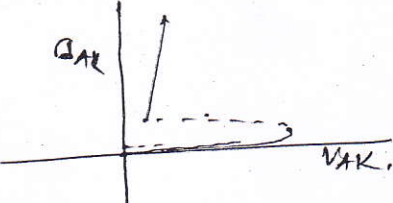
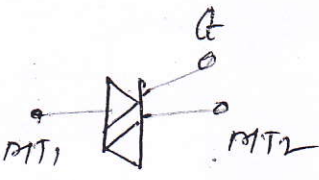
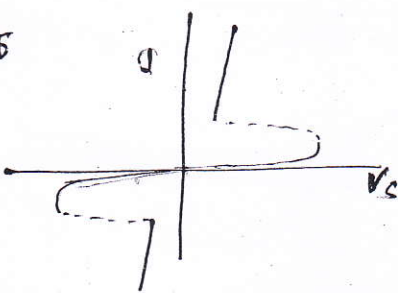
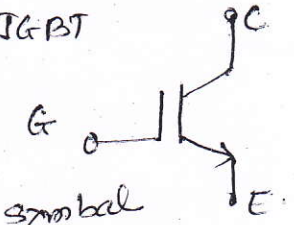
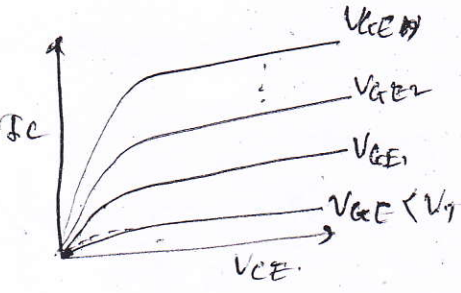
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Sem : 7		Subject : PE		Sub Code : 15EC 23		Date : 16/09/19	
Q. No.	Bit	Description		Marks	CO's	RBT Level	
4.	b.	i) LASER symbol VI charact.		2	(CO403.1)	L2	
							
							
		ii) GTOAC symbol VI charact.		2			
							
							
		iii) IGBT symbol o/p characteristics		2			
							
							

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