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Barasal, Kolkata -700125

Term End Examination 2022
Programme – Dip.ECE-2019
Course Name – Industrial Electronics I
Course Code - DECE504
(Semester V)

•	The figure in the annual to the figure	Time : 2:30 Hour	'S		
	. own words as far	didates are required to give their answers in their ras practicable.			
			•		
	Grou				
1	(Multiple Choice	Type Question) 1 x 15=15			
1.	Choose the correct alternative from the following	ng :			
(i)	A fully controlled converter uses				
	a) diodes only	b) thyristors only			
•	c) both diodes and thyristors	d) none of these			
(ii)	For a single phase, full bridge, diode rectifier excit	ted from a 230 V, 50 Hz source. With R = 10 ohm & nuous conduction, the value of the supply power	L		
•	a) 0.707 lag	b) 0.9 lag			
	c) 0.86 lag	d) Unity			
(iii)	Which of the following devices does not belong to the transistor family?				
	a) IGBT	b) MOSFET			
	c) GTO	d) BJT			
(iv)	A power transistor is a	4, 531			
	a) three layer, three junction device	h) three layer two innertant day			
	c) two layer, one junction device	b) three layer, two junction deviced) four layer, three junction device			
(v)	In a power transistor, is the controlled parar	meter.			
	a) VCE	b) VBE			
	c) IB	ط\ اه			
(vi)	A power BJT is used as a power control switch by saturation region (on state). In the on state	biasing it in the cut off region (off state) or in the			
	 both the base-emitter & base-collector junctions are forward biased 	b) the base-emitter junction is reverse biased, and the base collector junction is forward			
	c) the base-emitter junction is forward biased,	biased			
	and the base collector junction is reversed biased	d) both the base-collector & the base-emitter junctions are reversed biased			
vii)	For a power transistor, if the forward	rd current gain $\alpha = 0.97$, then $\beta = 2$			

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	c) 49.24	d) 32.33			
(viii)	The power electronics devices have a very high ef	fficiency because			
-	a) cooling is very efficient	b) the devices traverse active region a speed & stays at the two states, on a			
	c) the devices never operate in active region	 d) the devices always operate in the a region 			
(ix)	Choose the correct statement				
dy 5125	a) A transistor will remain on as long the the base current is applied	b) A transistor remains on after a high pulse is applied at the base			
(x)	t) A transistor will remain on as long the the collector current is applied	d) A transistor remains on after a high pulse is applied at the collector			
(~)	Let's say that a transistor is operating at the m current gain would	ilddle of the load line, then a decrease ii	n the		
	a) move the Q point up	b) move the Q point down			
(xi)	c) result in to & fro motion of the Q point A thyristor (SCR) is a	d) not change the Q point			
	a) P-N-P device	b) N-P-N device			
(xii)	c) P-N-P-N device With the anode positive with respect to the catho	d) P-N device ode & the gate circuit open, the SCR is si	aid to be in		
	the		ard to be m		
	a) m reverse blocking mode edium range frequency	b) reverse conduction mode			
(xiii)	c) forward blocking mode For an SCR in the forward blocking mode (practice	d) forward conduction mode			
	a) leakage current does not flow	b) leakage current flows from anode to cathode	0		
	 c) leakage current flows from cathode to anode 	d) leakage current flows from gate to	anode		
(xiv)	For the SCR to remain in the ON (conducting) state	e			
	a) gate signal is continuously required	b) no continuous gate signal is require	ed		
	c) no forward anode-cathode voltage is required	d) negative gate signal is continuously	required		
(xv)	lay time ii) Rise time and iii) Spread tim	e During the			
	a) anode current flows only near the gate	b) anode current rises from zero to ve value	ry high		
	c) losses are maximum	d) anode to cathode voltage is zero			
	Group	n-R			
	(Short Answer Ty		3 x 5=15		
	How will you classify the power diode?		(3)		
	What is a heat sink?		(3)		
	Explain the operation of the Darlington pair. What are switching losses in MOSFET?		(3)		
	What is the difference between power MOSFET an	d power BJT?	(3) (3)		
	OR		(3)		
	Explain switching characteristics of power MOSFET		(3)		
	Group				
	(Long Answer Typ	pe Questions)	5 x 6=30		
7. Describe the advantages & disadvantages of SMPS circuits. (5)					
8. What are the different types of losses in power semiconductor?9. Show that ideally, any power electronic converter should be losses. What is conduction					
9.	Show that ideally, any power electronic converter Page 2	of 3	(5) (5)		

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loss?	January State	
10. What is GTO?	Stainwaie University	(5
11. Draw and explain the V-I character	The state of the s	(5
With suitable waveforms explain t with R-L load.	he operation of a single-phase uncontrolled rectifier	(5
	OR	
Explain the operation of a single-p load.	hase controlled bridge converter connected with R-L	(5

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