ROLL NO. _____

Code: DE71/DE110

Subject: POWER ELECTRONICS

DiplETE – ET (Current & New Scheme)

PLEASE WRITE YOUR KOLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER. NOTE: There are 9 Questions in all. • Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else. • The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination. • Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks. • Any required data not explicitly given, may be suitably assumed and stated. Q1 Choose the correct or the best alternative in the following: (2) (3) (D) 4 b. In a thyristor holding current is (A) 1 (A) nore than latching current (D) every small c. A UIT exhibit's negative resistance region (A) before the peak point (B) between peak and valley point (C) after the valley point (D) both (A) and (B) (D) alogo (B) 60° (C) 90° (D) 120° e. Secondary break down occurs in (A) MOSFET but not in MOSFET (D) none of these f. In controlled rectifier, the nature of load and firing angle (B) depends both on the type of load and firing angle (A) does not depend on the type of load and firing angle (B) depends only on the type of load	Time: 3 Hours		JUNE 2016		Max. Marks: 100				
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	1.	(A) Forward vo	ltage triggering	(B) Gate triggeri	nσ				
(C) dV / dt triggering. (D) Thermal triggering.		(C) dV / dt trigg	gering.	(D) Thermal trigg	gering.				

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ROLL NO. _____

Code:	DE71/DE110	Subject: POWER ELECTRON	ICS				
	j. A modern power semiconduc	tor device that combines the characteristic of BJT					
	(A) IGBT	(B) FCT					
	(\mathbf{C}) MCT	(D) GTO					
Answer any FIVE Questions out of EIGHT Questions.							
	Each Que	stion carries 16 marks.					
Q.2	a. What is power electronics? L	ist any ten applications of power electronics.	(7)				
	b. Explain the series operation	on of power diodes with neat Circuit diagram	(0)				
03	a Give classification of power	transistors Explain the three operating regions of	()				
Q.5	a BJT and draw its output characteristics.						
	b. Compare MOSFET with BJT		(6)				
Q.4	a. Explain V-I characteristics of	SCR.	(8)				
	b. Explain di/dt and dv/dt protect	ction of SCRs.	(8)				
Q.5	a. Explain with a neat circuit dia	agram the working principle of a dual converter.	(10)				
c	b. A single phase full-wave connected to a 120 V source. If the delay angle (α) is 60°.	controlled rectifier with an inductive load is The resistive portion of the load is equal to 10Ω . Find :	(6)				
	(i) average load voltage (iii) form factor	(ii) average load current(iv) rectifier efficiency.	. ,				
Q.6	a. Draw the circuit diagram of a its working with waveforms.	three-phase half-wave rectifier circuit and explain	(9)				
	 b. A three-phase full-wave conv 208V,60 Hz supply and the le an average voltage of 50% of (i) The delay angle α (iii) The average output current 	verter is operated from a three-phase Y-connected bad resistance is $R=10\Omega$. If it is required to obtain maximum possible output voltage, calculate: (ii) maximum output voltage int (iv) average current of SCR	(7)				
Q.7	a. With a neat circuit diagram a BOOST chopper.	nd waveform, explain the operation of BUCK-	(10)				
	 b. The step-down DC chopper Vs =220V. Assume a lossles duty cycle is 50%, determine output voltage V₀ (c) output p 	has resistive load $R=10\Omega$ and the input voltage is s chopper and chopping frequency f=1 kHz. If the e (a) The average output voltage V _A (b) the RMS power.	(6)				
Q.8	a. With a neat circuit diagram phase full bridge inverter.	and wave forms explain the operation of Single-	(8)				
	 b. The single phase half-bridge source voltage Vs=48V. De frequency V1. (ii) The output reverse blocking voltage VB 	inverter has resistive load of R=2.4 Ω , and the dc termine (i) The RMS voltage at the fundamental at power P0. (iii) Peak thyristor current (iv) Peak R of each thyristor.	(6)				
	c. List any four applications of	nverters.	(2)				
Q.9	a. What is Static Var Compensa	itor?	(2)				
	b. What is static switch? L mechanical switch.	ist any four advantages of static switch over	(6)				
	c. With a neat circuit diagram a cycloconverter.	nd waveforms explain the working of single phase	(8)				

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