

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2018****Subject Code:2161006****Date:27/11/2018****Subject Name:Power Electronics Devices and Circuits****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Draw the symbol of following: (a)Diac (b) MCT (c) GTO	03
	(b) Describe what is Power Electronics with help of neat sketch of diagram? Also list out application of Power Electronics.	04
	(c) Explain construction and characteristics of following : (a)SCR (b) IGBT	07
Q.2	(a) Discuss comparison of Power BJT and Power MOSFET.	03
	(b) What are the requirements of gate triggering for SCR? List out different gate triggering circuits of SCR.	04
	(c) Discuss and derive UJT relaxation Oscillator for Triggering SCR with help of neat sketch of waveforms and circuit diagram.	07
OR		
	(c) Describe the single phase full wave controlled rectifier using RL load with help of proper waveforms and circuit diagram.	07
Q.3	(a) State types of Commutation in SCR.	03
	(b) An SCR with latching current of 200 mA is connected in series with dc voltage supply of 200V, resistance of 20 Ω and inductance of 2 H. Calculate the minimum gate pulse width to turn on SCR.	04
	(c) Describe the three (3- ϕ) phase full wave controlled rectifier using RL load and freewheeling diode with help of proper waveforms and circuit diagram.	07
OR		
Q.3	(a) What is a chopper? What is the application of chopper?	03
	(b) What is inverter? How do you classify the inverters?	04
	(c) Discuss the classification of DC converters with the help of circuit diagram and the quadrant of operation.	07
Q.4	(a) Give the difference between Voltage source Inverter and Current Source Inverter.	03
	(b) List out classification of voltage control techniques. Explain one of them.	04
	(c) Describe the auxiliary commutated inverters (McMurry inverter) with circuit diagram and waveform.	07

OR

- Q.4** (a) Discuss following: **www.FirstRanker.com** **www.FirstRanker.com** **03**
(a) Plugging (b) Regenerating Braking
- (b) List out various PWM techniques. Explain one of them. **04**
- (c) What is the basic principle of cycloconverters? Explain single phase to single phase cycloconverter with help of relevant circuit diagrams. **07**
- Q.5** (a) Define UPS. What is need of UPS? **03**
- (b) Explain constant V/f speed control technique for induction motor. **04**
- (c) With help of block schematic describe the use of Phase lock Loop (PLL) for speed control of DC motors. **07**

OR

- Q.5** (a) What is Commutation? Explain briefly the classification of commutation techniques. **03**
- (b) Draw and briefly explain closed control of DC drives. **04**
- (c) What is SMPS? Give the classification of SMPS. Also List out advantages and disadvantages of SMPS. **07**

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