TED (21)4031
(Revision-2021)

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, APRIL - 2025

POWER ELECTRONICS DEVICES & CIRCUITS

[Maximum marks: 75] [Time: 3 Hours]

PART A

I. Answer all the following questions in one word or one sentence. Each question carries 1 mark

(9 x 1 = 9 Marks)

		Module outcome	Cognitive level
1	Draw the symbol of GTO.	M1.01	R
2	Define latching current.	M1.02	R
3	Define controlled rectifier.	M2.01	R
4	List any two applications of controlled rectifiers.	M2.02	R
5	……..component is used in the switching section of SMPS.	M4.03	R
6	Mention the advantage of using freewheeling diode in controlled rectifiers.	M2.02	R
7	Write the purpose of Buck converter.	M3.04	R
8	Name the type of chopper which can be operated in all four quadrants.	M3.02	R
9	List two types of UPS	M4.03	R

PART B

II. Answer any eight questions from the following. Each question carries 3 marks.

(8 x 3 = 24 Marks)

		Module outcome	Cognitive level
1	List any three applications of IGBT.	M1.01	R
2	Describe type C chopper with help of circuit diagram.	M3.01	U
3	Draw the circuit of Single-phase half wave-controlled rectifier with R load.	M2.01	U
4	Draw the waveform of input voltage, output voltage, output current and voltage across thyristor of a single phase semi controlled rectifier with RL load	M2.03	U
5	Describe the basic block diagram of Electric drives.	M4.04	U
6	Differentiate CSI and VSI.	M4.01	U

7	Draw the circuit of a midpoint type step up cycloconverter.	M3.04	U
8	Define firing angle and conduction angle of SCR.	M2.01	R
9	If the input to the Chopper is 600V, output voltage is 200V, and the conducting time of chopper is 200 micro second, compute duty cycle and chopping frequency.	M3.01	A
10	Draw the circuit of single-phase full wave bridge rectifier with R load.	M2.02	U

PART C

Answer all questions. Each question carries seven marks

(6 x 7 = 42 Marks)

		Module outcome	Cognitive level
III	Explain the working of N Channel Enhancement MOSFET with proper diagram.	M1.01	U
	OR		
IV	Draw and explain the V-I Characteristics of SCR.	M1.02	U
V	Explain the circuit of a single-phase half wave-controlled rectifier with RL load and freewheeling diode with wave forms.	M2.01	U
	OR		
VI	With diagram explain the operation of a three-phase bridge converter with R load.	M2.04	U
VII	Draw and explain the operation of type E Chopper.	M3.02	U
	OR		
VIII	Explain with diagram the operation of Boost converter.	M3.03	U
IX	Draw and Explain the V-I characteristics of TRIAC.	M1.01	U
	OR		
X	Draw the structure and explain three modes of operation of SCR.	M1.02	U
XI	Explain the operation of servo voltage stabilizer with diagram.	M4.03	U
	OR		
XII	Explain the block diagram of SMPS.	M4.03	U
XIII	Draw and explain single phase Full bridge inverter with R L Load.	M4.02	U
	OR		
XIV	Explain the block diagram of Off line UPS.	M4.03	U

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