Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem Examination Dec 2024

OE00003 Industrial Electronics

Programme: B.Tech. Branch/Specialisation: All

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	PO	CO	PSO
Q.1	i.	Silicon controlled rectifier can be turned on..... (a) By applying a gate pulse and turned off only when current becomes zero (b) Turned off by applying gate pulse (c) By applying a gate pulse and turned off by removing the gate pulse (d) By making current negative and turned off by making current zero	**1**	1	1	1	
	ii.	The power MOSFET device is a..... (a) Current controlled unipolar device (b) Voltage controlled unipolar device (c) Current controlled bipolar device (d) Voltage controlled bipolar device	**1**	1	1	1	
	iii.	The most suited gate pulses given to the AC regulator with R–L load can be in the form of..... (a) Continuous signal (b) Large isolating pulse transformer (c) A train of pulses (d) None of these	**1**	1	1	2	
	iv.	Latching current is important for..... (a) SCR turn on (b) SCR turn off (c) Both (a) and (b) (d) None of these	**1**	1	1	2	
	v.	A chopper may be thought as a-	**1**	1	1	3	

P.T.O.

(a) Inverter with dc input
(b) DC equivalent of an ac transformer
(c) Diode rectifier
(d) DC equivalent of induction motor

vi. Which device can be used in chopper circuit? **1** 1 1 3
(a) BJT (b) MOSFET
(c) GTO (d) All of these

vii. The ac output voltage waveform of VSI and AC output current waveform of CSI respectively is composed of- **1** 1 1 4
(a) High dv/dt, low di/dt
(b) Low dv/dt, low di/dt
(c) Low dv/dt, high di/dt
(d) High dv/dt, high di/dt

viii. Single phase VSI are mainly used in- **1** 1 1 4
(a) Power supplies
(b) UPS
(c) Multilevel configuration
(d) All of these

ix. A cycloconverter is a- **1** 1 1 5
(a) One stage power converter
(b) One stage voltage converter
(c) One stage frequency converter
(d) None of these

x. AC voltage controllers convert- **1** 1 1 5
(a) Fixed ac to fixed dc
(b) Variable ac to variable dc
(c) Fixed ac to variable ac
(d) Variable ac to fixed ac

Q.2 i. Write different applications of DIAC. **2** 1 1 1
ii. What is power diode? Enlist different use of power diode. **3** 1 1 1
iii. Draw and explain V-I characteristic of SCR. **5** 2 1 1
OR iv. Explain two transistor analogy of thyristor. **5** 2 1 1

Q.3 i. Explain the characteristic of UJT. **3** 1 1 2

ii. Draw the waveform of phase-controlled rectifier (half wave) with RLE load and explain it's working. **7** 2 1 2
OR iii. How SCR turn off? Discuss any one commutation technique to turn off SCR. **7** 2 1 2

Q.4 i. Write the basic principle of chopper. **3** 1 1 3
ii. Describe the working of buck converter and boost converter. **7** 2 2 3
OR iii. Discuss the working of class B chopper with neat diagram. **7** 2 2 3

Q.5 i. Compare current source inverter and voltage source inverter. **4** 1 2 4
ii. Explain working of PWM inverter with neat diagram. **6** 2 2 4
OR iii. Draw and explain full bridge inverter. **6** 2 2 4

Q.6 Attempt any two:
i. Write any three industrial applications of cycloconverter. **3** 1 1 5
ii. Describe the working of cycloconverter with neat diagram. **7** 2 2 5
OR iii. What is ac voltage controller? Discuss its industrial application. **7** 1 2 5

******

Marking Scheme
OE00003 (T) Industrial Electronics (T)

Q.1	i)	(a) by applying a gate pulse and turned off only when current becomes zero	**1**
	ii)	(b) voltage controlled unipolar device	**1**
	iii)	(c) a train of pulses	**1**
	iv)	(a) SCR turn on	**1**
	v)	(b) dc equivalent of an ac transformer	**1**
	vi)	(d) All the mentioned	**1**
	vii)	(d) high dv/dt, high di/dt	**1**
	viii)	(d) all of these	**1**
	ix)	(c) one stage frequency converter	**1**
	x)	c) fixed ac to variable ac	**1**
Q.2	i.	Two applications	**2**
	ii.	power diode -1-mark, power diode uses- 2 marks	**3**
	iii.	Draw–2 marks, explain– 3 marks	**5**
OR	iv.	Explain with diagram- 5 marks	**5**
Q.3	i.	characteristic- 3 marks	**3**
	ii.	Draw-3 marks, working -4 marks	**7**
OR	iii.	SCR turn off- 3 marks, one commutation technique- 4 marks	**7**
Q.4	i.	Principle- 3 marks	**3**
	ii.	3.5 marks each	**7**
OR	iii.	Diagram- 3marks, working- 4 marks	**7**
Q.5	i.	Compare four point- 4 marks	**4**
	ii.	Diagram- 2marks, working- 4 marks	**6**
OR	iii.	Draw- 2 marks, explain-4 marks	**6**
Q.6			
	i.	Each 1 mark	**3**
	ii.	Diagram- 3marks, working- 4 marks	**7**
	iii.	ac voltage controller-5 marks, application- 2 marks	**7**

******

P.T.O.