



PRESIDENCY UNIVERSITY

BENGALURU

Roll No.												
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End - Term Examinations - May/June 2026

Date: 18-05-2026

Time: 01:00pm – 04:00pm

School: SOE	Program: B. Tech	
Course Code: ECE3016	Course Name: Electronic Controlled Converter	
Semester: VI	Max Marks: 100	Weightage: 50%

CO - Levels	C01	C02	C03	C04	C05	C06
Marks	15-20	20-25	20-25	15-20	15-20	15-20

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.

10Q x 2M=20M

1.	Define Power Electronics.	2 Marks	L1	C01
2.	Draw the block diagram of a power electronic system.	2 Marks	L1	C01
3.	Define AC to controlled DC converter.	2 Marks	L2	C02
4.	What is a single-phase full bridge controlled converter?	2 Marks	L2	C02
5.	Define DC-DC converter.	2 Marks	L2	C03
6.	What is a Buck converter?	2 Marks	L2	C03
7.	Define inverter.	2 Marks	L2	C04
8.	What is a single-phase full bridge inverter?	2 Marks	L2	C04
9.	Define AC voltage controller.	2 Marks	L2	C05
10.	What is the role of TRIAC in AC voltage controller?	2 Marks	L2	C06

Part B

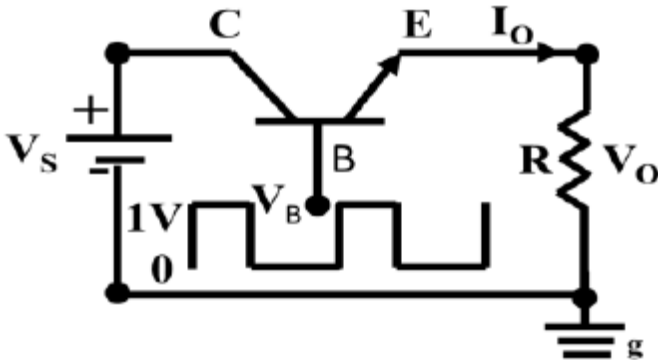
Answer the Questions.

4Qx 20M = 80M

11.	a.	Describe different power semiconductor devices (SCR, GTO, IGBT) and explain their control characteristics	10 Marks	L3	CO1
	b.	The half wave controlled rectifier has a supply voltage $V_s = 220V$, $R = 10\Omega$, and the delay angle $\alpha = 0, \frac{\pi}{4}, \frac{\pi}{2}$. Determine (i) V_{odc} (ii) V_{orms} (ii) η (ii) FF (iii) RF (iv) TUF (v)	10 Marks	L3	CO2

Or

12.	a.	Discuss gating pulse generation techniques, isolation methods, and gate drive circuits used in controlled rectifiers.	10 Marks	L3	CO1
	b.	The step down chopper has resistive load of $R = 10\Omega$, the dc input voltage $V_s = 200V$ and voltage across the chopper when it is ON $V_{ch} = 2V$. If the chopping frequency $f = 1kHz$ and duty cycle is 70% determine (i) Average output voltage (ii) RMS output voltage (iii) Chopper efficiency (iv) Effective input resistance	10 Marks	L3	CO2

13.	a.	Describe the Flyback converter with associated waveforms.	10 Marks	L3	CO3
	b.	For the transistor chopper circuit shown in Fig.1 a dc supply of 120V is applied and the transistor is switched by applying periodic base pulses of voltage varying between 0 to 1V. The chopper frequency is 200Hz, duty cycle is 33.33% and load resistance of 10Ω. Sketch the load voltage with reference to the input base pulses and calculate (i) Average output voltage (ii) Average load current  Fig.1	10 Marks	L3	CO3

Or

14.	a.	Explain the working of a single-phase AC voltage controller using two thyristors with waveforms.	08 Marks	L2	CO5
	b.	A 1- Φ half wave AC voltage controller has a resistive load of $R=6\Omega$ and input voltage $V_s=230V$, 50Hz. The thyristor switch is	12 Marks	L2	CO4

		triggered at an angle of $\alpha = \pi/2$. Determine (i) RMS output voltage (ii) Input power factor (iii) Average input current.			
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15.	a.	Explain the importance of isolation and gate drive circuits in power electronic systems.	10 Marks	L3	C05
	b.	A 1- Φ full converter is connected to 230V, 50Hz supply, the load current is assumed to be continuous and ripple free, if the delay angle is $\alpha = \pi/2$ calculate V_{odc} , V_{on} , V_{orms} , and efficiency?	10 Marks	L2	C02

Or

16.	a.	Explain the operation of a single-phase half bridge inverter with necessary waveforms.	12 Marks	L2	C03
	b.	The 1- Φ half bridge inverter has a resistive load of 10Ω and the DC input voltage is 24V. Calculate (i) RMS output voltage (ii) Fundamental component of the output voltage (iii) First five harmonics of the output voltage (iv) Fundamental power consumed by the load (v) RMS power consumed by the load.	08 Marks	L2	C02

17.	a.	Explain the operation of a single-phase half controlled converter using one SCR with waveforms.	12 Marks	L2	C04
	b.	The 1- Φ full bridge inverter has a resistive load of 10Ω and the DC input voltage is 24V. Calculate (i) RMS output voltage (ii) Fundamental component of the output voltage (iii) First five harmonics of the output voltage (iv) Fundamental power consumed by the load (v) RMS power consumed by the load.	08 Marks	L3	C03

Or

18.	a.	Explain single PWM and sine PWM (SPWM) techniques with suitable waveforms and write their RMS output voltage equations	12 Marks	L3	C06
	b.	Explain the operation of a single-phase fully controlled converter using one SCR with waveforms.	08 Marks	L3	C06