

University of Mumbai
Examination 2020

Program: Electronics Engineering

Curriculum Scheme: Rev 2012

Examination: First/Second/Third/Final Year Semester VI

Course Code: EXC 604

Course Name: Power Electronics-I

Time: 1 hour

Max. Marks: 50

For the students:- All the Questions are compulsory and carry equal marks .

Q1.	The DIAC can be represented by
Option A:	two SCRs in anti-parallel
Option B:	two SCRs in parallel
Option C:	two diodes in anti-parallel
Option D:	two diodes in parallel
Q2.	The TRIAC can be represented by
Option A:	two SCRs in anti-parallel
Option B:	two SCRs in parallel
Option C:	two diodes in anti-parallel
Option D:	two diodes in parallel
Q3.	The TRIAC's terminals are
Option A:	gate, anode, cathode
Option B:	MT1, MT2, gate
Option C:	gate1, gate2, anode, cathode
Option D:	MT1, MT2, gate1, gate2
Q4.	A power transistor is a
Option A:	three layer, three junction device
Option B:	three layer, two junction device
Option C:	two layer, one junction device
Option D:	four layer, three junction device
Q5.	Choose the correct statement
Option A:	MOSFET is a uncontrolled device
Option B:	MOSFET is a voltage controlled device
Option C:	MOSFET is a current controlled device
Option D:	MOSFET is a temperature controlled device
Q6.	A thyristor (SCR) is a
Option A:	P-N-P device
Option B:	N-P-N device
Option C:	P-N-P-N device
Option D:	P-N device
Q7.	In the SCR structure the gate terminal is located
Option A:	near the anode terminal

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Option B:	near the cathode terminal
Option C:	in between the anode & cathode terminal
Option D:	none of the mentioned
Q8.	A thyristor can be brought from the forward conduction mode to forward blocking mode by
Option A:	the dv/dt triggering method
Option B:	applying a negative gate signal
Option C:	applying a positive gate signal
Option D:	applying a reverse voltage across anode-cathode terminals
Q9.	For the SCR to remain in the ON (conducting) state
Option A:	gate signal is continuously required
Option B:	no continuous gate signal is required
Option C:	no forward anode-cathode voltage is required
Option D:	negative gate signal is continuously required
Q10.	The average output voltage of single phase half-wave is maximum when SCR is triggered at $\omega t =$
Option A:	π
Option B:	0
Option C:	$\pi/2$
Option D:	$\pi/4$
Q11.	For a single phase half-wave, thyristor circuit with R load, the input power factor is given by
Option A:	rms source voltage/total rms line current
Option B:	rms input power/power delivered to the load
Option C:	$\cos \alpha$
Option D:	power delivered to load/input VA
Q12.	In a semi-converter with RLE load during the freewheeling period, the energy is
Option A:	fed back to the source
Option B:	fed to the inductor(L) and absorbed by E
Option C:	absorbed by the L & E and dissipated at R
Option D:	fed to the L & E and dissipated at R
Q13.	A single-phase semi-converter is connected to a 230 V source and is feeding a load $R = 10 \Omega$ in series with a large inductance that makes the load current ripple free. Find the average output current for $\alpha = 45^\circ$.
Option A:	14 A
Option B:	17 A
Option C:	10 A
Option D:	0 A

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Q14.	Inverters converts
Option A:	dc power to dc power
Option B:	dc power to ac power
Option C:	ac power to ac power
Option D:	ac power to dc power
Q15.	_____ based inverters do not require self-commutation.
Option A:	IGBT
Option B:	GTO
Option C:	PMOSFET
Option D:	SCR
Q16.	The output current wave of a single-phase full bridge inverter on RL load is
Option A:	a sine wave
Option B:	a square wave
Option C:	a triangular wave
Option D:	constant dc
Q17.	Several equidistant pulses per half cycle are used in _____ type of modulation technique.
Option A:	single-pulse
Option B:	multiple-pulse
Option C:	sine-pulse
Option D:	equidistant-pulse
Q18.	A chopper may be thought as a
Option A:	Inverter with DC input
Option B:	Diode rectifier
Option C:	DC equivalent of an AC transformer
Option D:	DC equivalent of an induction motor
Q19.	The load voltage of a chopper can be controlled by varying the
Option A:	duty cycle
Option B:	firing angle
Option C:	reactor position
Option D:	extinction angle
Q20.	Find the expression for output voltage for a step-up chopper, assume linear variation of load current and α as the duty cycle.
Option A:	V_s
Option B:	V_s/α
Option C:	$V_s/(1-\alpha)$
Option D:	$V_s/\sqrt{2}$
Q21.	If a step up chopper's switch is always kept off then (ideally)

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Option A:	$V_o = 0$
Option B:	$V_o = \infty$
Option C:	$V_o = V_s$
Option D:	$V_o > V_s$
Q22.	The AC voltage controllers are used in _____ applications.
Option A:	power generation
Option B:	electric heating
Option C:	conveyor belt motion
Option D:	power transmission
Q23.	In the integral cycle control of ac voltage controller, is the load is on for n cycles and off for m cycles, then the periodicity is given by? Consider the output is sinusoidal.
Option A:	$m/2\pi(m+n)$
Option B:	$n/2\pi(m+n)$
Option C:	$m/\pi(m+n)$
Option D:	$n/\pi(m+n)$
Q24.	A cycloconverter is a _____
Option A:	one stage power converter
Option B:	one stage voltage converter
Option C:	one stage frequency converter
Option D:	none of the mentioned
Q25.	Earlier then the semiconductor technology, _____ devices were used for voltage control applications.
Option A:	cycloconverters
Option B:	vacuum tubes
Option C:	tap changing transformer
Option D:	induction machine