SAMPLE PAPER

Electronics Engineering

Curriculum Scheme: R2016

Examination: BE Semester: VII

Course Code: ELX702 and Course Name: POWER ELECTRONICS

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	In an SCR , relation between latching current and holding current is
Option A:	latching current > holding current
Option B:	latching current < holding current
Option C:	latching current = holding current
Option D:	latching current and holding current have no relation
2.	In a P1-N1-P2-N2 structure of SCR the Breakover voltage of SCR depends upon
Option A:	P1 layer
Option B:	N1 layer
Option C:	P2 layer
Option D:	N2 layer
3.	The on state drop of a 100volt SCR is
Option A:	100v approximately
Option B:	1v approximately
Option C:	150v approximately
Option D:	Varies with load
4.	The number of SCRs in half controlled Rectifier is
Option A:	1
Option B:	2
Option C:	3
Option D:	4
5.	The number of SCRs in 1 phase asymmetrical semi-converter are
Option A:	2
Option B:	4
Option C:	6
Option D:	3
6.	The output voltage of a 1 phase fully controlled converter is
Option A:	$\frac{2V_m}{\pi}(1 + cos\ \alpha)$
Option B:	$\frac{\sqrt{2}.V_m}{\pi}(1 + cos\ \alpha)$
Option C:	$\frac{V_m}{\pi}(1 + cos\ \alpha)$
Option D:	$\frac{2V_m}{\pi}\ cos\ \alpha$
7.	Which class of commutation uses undamped circuit to turn off the conducting

	SCR
Option A:	A
Option B:	B
Option C:	C
Option D:	E
8.	Turn off time of SCR should be _____ circuit turn off time
Option A:	Less then
Option B:	More then
Option C:	Equal to
Option D:	Independent of
9.	In a boost converter the output voltage is_____. Where D is the duty cycle of chopper and Vin the input voltage
Option A:	DVin
Option B:	(1/D)Vin
Option C:	(1/1-D) Vin
Option D:	(1-D) Vin
10.	In a load commutated chopper, the commutating components are
Option A:	C,L,Diode
Option B:	C, load
Option C:	Under damped RLC circuit
Option D:	Undamped LC circuit.
11.	dv/dt protection is provided to the SCR by
Option A:	connecting a capacitor in parallel with the load
Option B:	connecting an inductor in series with the load
Option C:	connecting a capacitor & resister in parallel with the device
Option D:	connecting an inductor & resister in parallel with the device
12.	Over-current protection in SCRs is achieved through the use of
Option A:	variastors
Option B:	snubber circuits
Option C:	Circuit breakers and FACLF
Option D:	zener diodes
13.	di/dt protection is provided to the thryistor by
Option A:	connecting an inductor in parallel across the load
Option B:	connecting an inductor in series with the load
Option C:	connecting an inductor in parallel across the gate terminal
Option D:	connecting an inductor in series with the SCR
14.	The local hot spot formation in the cross-section of the SCR is avoided by
Option A:	reducing the junction temperature
Option B:	applying gate current nearer to the maximum gate current
Option C:	using only R loads
Option D:	proper mounting of the SCR on heat sink
15.	When latch-up occurs in an IGBT

Option A:	Ig is no longer controllable
Option B:	Ic is no longer controllable
Option C:	the device turns off
Option D:	Ic increases to a very high value
16.	A power Inverter is used to _____
Option A:	convert AC to DC
Option B:	convert DC to AC
Option C:	convert DC to DC
Option D:	convert AC to AC
17.	A cyclo-converter is a
Option A:	AC to AC converter
Option B:	DC to AC converter
Option C:	DC to DC converter
Option D:	AC to DC converter
18.	Which among the following is the highest power handling device
Option A:	Power BJT
Option B:	Power MOSFET
Option C:	IGBT
Option D:	SCR
19.	Which among the following can be the most suitable for moderate power handling and high speed applications?
Option A:	SCR
Option B:	MOSFET
Option C:	IGBT
Option D:	power BJT
20.	Tn an SCR the dv/dt protection is provided by
Option A:	Connecting a series inductor
Option B:	Connecting a series capacitor
Option C:	Connecting a parallel capacitor
Option D:	Connecting a parallel inductor.

Q2 **(20 Marks)**	**Solve any Four out of Six 5 marks each** **Please delete the instruction shown in front of every sub question**
A	How does a semi-converter improve the power factor of the circuit.
B	Draw the wave-forms for a class B commutation circuit.
C	Derive the expression of output voltage of a Buck converter in continuous conduction mode. Draw the circuit and waveforms.
D	Differentiate between SCR and IGBT.
E	Explain dynamic characteristics of IGBT.
F	Discuss the need of harmonic reduction in inverters.

Q3.	**Solve any Two Questions out of Three 10 marks each**

(20 Marks)	
A	Explain the working of Jone's chopper with the help of circuit diagrams and waveforms.
B	Explain the working of 1 phase controlled rectifier feeding highly inductive load considering the effect of source inductance.
C	Explain the working of single phase full bridge voltage source inverter with R load with the help of waveforms.