PSN College of Engineering and Technology
An Autonomous Institution, Affiliated to Anna University
Approved by AICTE, Accredited by NAAC with A+ Grade

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Regulation - 2018

Multiple Choice Questions

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Course Code: E6504209
Course Name: POWER ELECTRONICS

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Institute Vision and Mission

VISION

To provide an academic environment to learn, work and do research enabling the student's faces challenges in life with strong ethical values.

MISSION

- To achieve greater heights of excellence in technical knowledge and skill development through innovative teaching and learning practices.
- To develop the infrastructure to meet the demands of technological revolution.
- To improve and foster research in all dimensions for betterment of society.
- To develop individual competencies to enhance employability and entrepreneurship in students.
- To instil higher standards of discipline among students, inculcating ethical and moral values for societal harmony and peace.

Department Vision and Mission

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VISION

The department aims at imparting high quality education to Electrical and Electronics Engineering students with active learning, critical thinking with ethical values to meet the global challenges.

MISSION

- To provide advanced knowledge and skills for Learning under congenial environment for global placement and entrepreneurship.
- To stimulate the process of critical thinking and solving the problems with focus on research capabilities.
- To enhance professional ethics and standards to meet the demands of society

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

PROGRAM EDUCATIONAL OBJECTIVES

S. No	Objective	PEOs
PEO1	Basic Knowledge	To impart fundamental knowledge in the field of Electrical and Electronics Engineering and enabling them to occupy responsible positions in their career.
PEO2	Problem Solving Skill	To enhance the analytical skills of the students by learning process and making themselves to identify, apprehend and solve problems using modern tools.
PEO3	Societal Response	To make use of their technical expertise for Socially beneficial activities and transform them in responsible positions.

PROGRAM OUTCOMES

PO'S NO	KNOWLEDGE	STATEMENT	APPLIANCE
1	Engineering Knowledge	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	Theory / Practical / Project work
2	Problem Analysis	Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	Theory / Practical / Projects
3	Design/ Development of Solutions	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.	Theory / Practical / Projects
4	Conduct Investigations of Complex Problems	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.	Theory / Practical
5	Modern Tool usage	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.	Theory / Practical / Project work
6	The Engineer and Society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.	Theory / Industrial visit / Inplant training
7	Environment and Sustainability	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	Theory / Industrial Visit / In plant Training
8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	Theory / Industrial visit / Inplant training
9	Individual and Team Work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	Projects
10	Communication	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	Projects / Seminar / Mini Project
11	Project Management and Finance	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	Projects
12	Life-long Learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	Projects / Higher Studies

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1: Ability to work professionally in the field of Power System, Control system and Power Electronics with the knowledge of operation and Maintenance.

PSO 2: Ability to solve complex real time problems in Electrical and Electronics Engineering field using modern tools.

Multiple Choice Question Bank

Branch: B.E	Regulation: 2022	Year / Semester: V/5
Course Code: E650209	Course Name: POWER ELECTRONICS	

UNIT – 1 - POWER SEMI CONDUCTOR DEVICES

1.	To make a signal diode suitable for high current & high voltage carrying applications with minimum losses,			
	a) a lightly doped n layer is grown between the two p & n layers	b) a heavily doped n layer is grown between the two p & n layers	c) a lightly doped p layer is grown between the two p & n layers	d) a heavily doped p layer is grown between the two p & n layers
	Answer: a			
2.	Power diode is			
	a) a three terminal semiconductor device	b) a two terminal semiconductor device	c) a four terminal semiconductor device	d) a three terminal analog device
	Answer: b			
3.	The V-I Characteristics of the diode lie in the			
	a) 1st & 2nd quadrant	b) 1st & 3rd quadrant	c) 1st & 4th quadrant	d) Only in the 1st quadrant
	Answer: b			
4.	A diode is said to be reversed biased when the			
	a) cathode is positive with respect to the anode	b) anode is positive with respect to the cathode	c) cathode is negative with respect to the anode	d) both cathode & anode are negative
	Answer: a			
5.	A power diode with small softness factor (S-factor) has			
	a) small oscillatory over voltages	b) large oscillatory over voltages	c) large peak reverse current	d) small peak reverse current
	Answer: b			
6.	Which of the following diodes uses a metal-semiconductor junction?			
	a) General purpose diodes	b) Fast recovery diodes	c) Schottky diode	d) None of the mentioned
	Answer: c			
7.	A Schottky diode _____			

	a) has current flow due to holes only	b) has no reverse recovery time	c) has large amount of storage charges	d) has zero cut-in voltage
	Answer: B			
8.	The forward current gain α is given by			
	a) I_C/I_B	b) I_C/I_E	c) I_E/I_C	d) I_E/I_B
	Answer: b			
9.	A Schottky diode has			
	a) a gate terminal	b) aluminum-silicon junction	c) platinum gold junction	d) germanium-Arsenide junction
	Answer: b			
10.	A power transistor is a			
	a) three layer, three junction device	b) three layer, two junction device	c) two layer, one junction device	d) four layer, three junction device
	Answer: b			
11.	If the doping levels of the semiconductor is increased, then the width of the depletion layer			
	a) increases	b) decreases	c) is unchanged	d) keeps oscillating
	Answer: b			
12.	The MOSFET combines the areas of &			
	a) field effect & MOS technology	b) semiconductor & TTL	c) mos technology & CMOS technology	d) none of the mentioned
	Answer: a			
13.	Choose the correct statement			
	a) MOSFET is a unipolar, voltage controlled, two terminal device	b) MOSFET is a bipolar, current controlled, three terminal device	c) MOSFET is a unipolar, voltage controlled, three terminal device	d) MOSFET is a bipolar, current controlled, two terminal device
	Answer: c			
14.	In the internal structure of a MOSFET, a parasitic BJT exists between the			
	a) source & gate terminals	b) source & drain terminals	c) drain & gate terminals	d) there is no parasitic BJT in MOSFET
	Answer: b			
15.	The output characteristics of a MOSFET, is a plot of			
	a) Id as a function of Vgs with Vds as a parameter	b) Id as a function of Vds with Vgs as a parameter	c) Ig as a function of Vgs with Vds as a parameter	d) Ig as a function of Vds with Vgs as a parameter
	Answer: b			
16.	At turn-on the initial delay or turn on delay is the time required for the			

	a) input inductance to charge to the threshold value	b) input capacitance to charge to the threshold value	c) input inductance to discharge to the threshold value	d) input capacitance to discharge to the threshold value
	Answer: b			
17.	Choose the correct statement			
	a) MOSFET suffers from secondary breakdown problems	b) MOSFET has lower switching losses as compared to other devices	c) MOSFET has high value of on-state resistance as compared to other devices	d) All of the mentioned
	Answer: b			
18.	The basic advantage of the CMOS technology is that			
	a) It is easily available	b) It has small size	c) It has lower power consumption	d) It has better switching capabilities
	Answer: c			
19.	IGBT & BJT both posses ___			
	a) low on-state power losses	b) high on-state power losses	c) low switching losses	d) high input impedance
	Answer: a			
20.	The correct sequence of the given devices for increasing order of their speed of operation is			
	a) Power BJT, Power MOSFET, IGBT, SCR	b) IGBT, Power MOSFET, Power BJT, SCR	c) SCR, Power BJT, IGBT , Power MOSFET	d) Power MOSFET, IGBT, Power BJT, SCR
	Answer: c			
21.	In IGBT, the p^+ layer connected to the collector terminal is called as the			
	a) drift layer	b) injection layer	c) body layer	d) collector Layer
	Answer: b			
22.	The voltage blocking capability of the IGBT is determined by the			
	a) injection layer	b) body layer	c) metal used for the contacts	d) drift layer
	Answer: d			
23.	The structure of the IGBT is a			
	a) P-N-P structure connected by a MOS gate	b) N-N-P-P structure connected by a MOS gate	c) P-N-P-N structure connected by a MOS gate	d) N-P-N-P structure connected by a MOS gate
	Answer: c			
24.	When latch-up occurs in an IGBT			
	a) Ig is no longer controllable	b) Ic is no longer controllable	c) the device turns off	d) Ic increases to a very high value
	Answer: b			
25.	In an IGBT, during the turn-on time			
	a) Vge decreases	b) Ic decreases	c) Vce decreases	d) none of the mentioned

	Answer: c			
26.	The approximate equivalent circuit of an IGBT consists of			
	a) a BJT & a MOSFET	b) a MOSFET & a MCT	c) two BJTs	d) two MOSFETs
	Answer: a			
27.	At present, the state-of-the-art semiconductor devices are begin manufactured using			
	a) Semiconducting Diamond	b) Gallium-Arsenide	c) Germanium	d) Silicon-Carbide
	Answer: d			
28.	The GTO can be turned off			
	a) by a positive gate pulse	b) by a negative gate pulse	c) by a negative anode-cathode voltage	d) by removing the gate pulse
	Answer: b			
29.	Gold doped GTOs have _____ as compared to the conventional GTOs			
	a) high turn-off time	b) low negative gate current requirement	c) low reverse voltage blocking capabilities	d) lower positive gate current requirement
	Answer: b			
30.	A snubber circuit is used to			
	a) Limit the rate of rising in voltage across BJT	b)Limit the rate of rising in voltage across SCR	c) Limit the rate of rising in current across TRIAC	d) Limit the rate of rising in current across BJT
	Answer: b			

UNIT – 2 – AC TO DC CONVERTERS

1.	A single-phase full wave rectifier is a			
	a) single pulse rectifier	b) multiple pulse rectifier	c) two pulse rectifier	d) three pulse rectifier
	Answer: c			
2.	A freewheeling diode is phase-controlled rectifiers.			
	a. Stops rectifier operations	b. Improves line power factor	c. Is the reason for additional harmonics	d. Is the reason for the sudden breakdown
	Answer: b			
3.	_____ commutation technique is commonly employed in series inverters.			
	a) line	b) load	c) forced	d) external-pulse
	Answer: b			

4.	In a three-phase bridge rectifier, the maximum conduction of each thyristor is			
	a.120^0	b. 90^0	c. 30^0	d. 60^0
	Answer: a			
5.	In a 3-∅ controlled bridge rectifier, the frequency of ripple in the output voltage depends on			
	a. Power factor	b.Supply frequency	c. Voltage source	d. Firing angle
	Answer: b			
6.	What is the name of a converter which can work on both in 3-pulse and 6 pulse modes?			
	a. Three-phase full-wave converter	b. Three-phase half wave converter	c. Three-phase semi converter	d. Single-phase semi converter
	Answer: c			
7.	A single-phase full wave mid-point type diode rectifier requires _____ number of diodes whereas bridge type requires _____			
	a)1,2	b)2,4	c)4,8	d) 3,2
	Answer: b			
8.	The PIV experienced by the diodes in the mid-point type configuration is			
	a)Vm	b)2Vm	c)4Vm	d) Vm/2
	Answer: b			
9.	The firing-angle delay is			
	a) inversely proportional to the synchronizing transformer voltage	b) inversely proportional to the control signal voltage	c) directly proportional to the synchronizing transformer voltage	d) directly proportional to the control signal voltage
	Answer: d			
10.	In case of a cosine firing scheme, _____ is used to get a cosine wave			
	a) ic 555	b) a comparator	c) an integrator circuit	d) a differentiator circuit
	Answer: c			
11.	The decaying factor in the wave shape of the output pulses from the pulse transformer is its			
	a) transformer ratio	b) inductance	c) capacitance	d) resistance
	Answer: b			

12.	The thyristor turn-off requires that the anode current			
	a) falls below the holding current	b) falls below the latching current	c) rises above the holding current	d) rises above the latching current
	Answer: a			

13.	The type of commutation when the load is commutated by transferring its load current to another incoming thyristor is			
	a) class A or load commutation	b) class B or resonant commutation	c) class C or complementary commutation	d) class D or impulse commutation
	Answer: c			

14.	The natural reversal of ac supply voltage commutates the SCR in case of			
	a) forced commutation	b) only line commutation	c) only natural commutation	d) both line & natural commutation
	Answer: d			

15.	What is the relationship between DF, CDF and PF?			
	a) PF = CDF = DF	b) PF = CDF/DF	c) PF = DF/CDF	d) PF = CDF x DF
	Answer: d			

16.	The effect of source inductance on the performance of a 3-phase controlled converter is to			
	a) increase the average load voltage	b) reduce the average load voltage	c) make the load current continuous	d) remove ripples from the load current
	Answer: b			

17.	The range of firing angle for a 3-phase, 3-pulse converter feeding a resistive load is _____ (in degrees).			
	a) 0 to 180	b) 0 to 150	c) 30 to 150	d) 30 to 180
	Answer: b			

18.	In a 3-phase semi-converter, for firing angle less than 60° the freewheeling diode conducts for			
	a) 30°	b) 60°	c) 120°	d) 0
	Answer: d			

19.	A three phase six pulse full converter works as a ac to dc converter for firing angles in the range			
	a) $\alpha > 90$	b) $90 < \alpha < 180$	c) $0 < \alpha < 90$	d) $0 < \alpha < 360$
	Answer: c			

20.	In case of a three phase full controlled converter with 6 SCRs, commutation occurs every			
	a) 120°	b) 60°	c) 180°	d) 30°
	Answer: b			
21.	Find the average output dc voltage of a single-phase semi-converter with Vs=230 V and firing angle of 30°. The converter is operating under continuous conduction.			
	a) a) 193 V	b) 256 V	c) 0 V	d) 230 V
	Answer: a			
22.	A single-phase semi-converter is operated from a 240 V, 60 Hz, AC source. It is fired at an angle of 45°. Find the value of average output voltage.			
	a) 176 V	b) 184 V	c) 167 V	d) 148 V
	Answer: b			
23.	In a semi-converter with RLE load during the freewheeling period, the energy is			
	a) fed back to the source	b) fed to the inductor(L) and absorbed by E	c) absorbed by the L & E and dissipated at R	d) fed to the L & E and dissipated at R
	Answer: d			
24.	A semi-converter with RLE load and a freewheeling diode has discontinuous load current with firing angle α and extinction angle β. The freewheeling period is			
	a) π>ωt<β	b) π>ωt<β	c) π<ωt>β	d) π>ωt>β
	Answer: a			
25.	In a single phase semi converter with resistive load and a firing angle α, each SCR and freewheeling diode would conduct for			
	a) α, 0°	b) π-α, α	c) π+α, α	d) π-α, 0°
	Answer: d			
26.	A freewheeling diode placed across a RL load provides			
	a) fast turn-on time	b) slow turn-off time	c) poor utilization factor	d) better power factor
	Answer: d			
27.	In non-circulating current mode dual converters, the circulating current is avoided by			
	a) connecting a series reactor	b) maintaining α1 + α2 = 180°	c) operating only one converter	d) adding an extra SCR
	Answer: c			

28.	A dual converters has			
	a) two full converters in series	b) two half converters in series	c) two full converters in anti-parallel	d) two half converters in anti-parallel
	Answer: c			
29.	A single full converter alone can given a			
	a) four quadrant operation	b) three quadrant operation	c) two quadrant operation	d) none of the mentioned
	Answer: c			
30.	A single-phase half wave circuit has Vs = 230 V with a R load of 100 Ω. Find the average load current at α = 30°.			
	a) 1.45 A	b) 0.57 A	c) 0.96 A	d) 2.3 A
	Answer: c			

UNIT – 3 - CHOPPERS

1.	In the _____ type of chopper, two stage conversions takes place.			
	a) AC-DC	b) AC link	c) DC link	d) None of the mentioned
	Answer: b			
2.	For a step-up chopper, when the duty cycle is increased the average value of the output voltage			
	a) increases	b) decreases	c) remains the same	d) none of the mentioned
	Answer: a			
3.	For a step-up/step-down chopper, if α (duty cycle) = 0.5 then			
	a) Vo = Vs	b) Vo < Vs	c) Vo > Vs	d) none of the mentioned
	Answer: a			
4.	In case of TRC (Time Ratio Control), _____ is varied			
	a) duty cycle	b) firing angle	c) supply frequency	d) supply voltage magnitude
	Answer: a			

5.	In case of a constant frequency system, Ton = (1/4)T. If the chopping frequency 2 kHz, find the value of Toff.			
	a) (1/8) ms	b) (3/8) ms	c) (1/8) μs	d) (3/8) μs
	Answer: b			

6.	The control strategy in which on and off time is guided by the pervious set of values of a certain parameter is called as			
	a) time ratio control	b) pulse width modulation	c) current limit control	d) constant frequency scheme
	Answer: c			

7.	Which of the following mentioned control strategy/strategies would require a feedback loop?			
	a) pwm	b) constant frequency system	c) current limit control	d) none of the mentioned
	Answer: c			

8.	Type C chopper consists of			
	a) two diodes and two switches	b) one diode and one switch	c) one diode and three switches	d) three diodes and two switches
	Answer: a			

9.	A chopper may be thought as a			
	a) Inverter with DC input	b) DC equivalent of an AC transformer	c) Diode rectifier	d) DC equivalent of an induction motor
	Answer: b			

10.	A chopper is a			
	a) Time ratio controller	b) AC to DC converter	c) DC transformer	d) High speed semiconductor switch
	Answer: d			

11.	The load voltage of a chopper can be controlled by varying the			
	a) duty cycle	b) firing angle	c) reactor position	d) extinction angle
	Answer: a			

12.	In a step down chopper, if Vs = 100 V and the chopper is operated at a duty cycle of 75 %. Find the output voltage.			
	a) 100 V	b) 75 V	c) 25 V	d) none of the mentioned
	Answer: b			

13.	Find the expression for output voltage for a step-up chopper, assume linear variation of load current and α as the duty cycle.

a) Vs	b) Vs/α	c) Vs/(1-α)	d) Vs/√2

Answer: c

14.	If a step up chopper's switch is always kept open then (ideally)

a) Vo = 0	b) Vo = ∞	c) Vo = Vs	d) Vo > Vs

Answer: b

15.	A step down chopper is operated at 240V at duty cycle of 75%. Find the value of RMS switch (IGBT/MOSFET) current. Take R = 10 Ω.

a) 2.07 A	b) 200 mA	c) 1.58 A	d) 2.4 A

Answer: a

16.	In a type-D chopper

a) current can flow in both the directions of the load	b) current cannot flow in both the directions of the load	c) voltage can only be positive	d) voltage can only be negative

Answer: b

17.	A type C chopper consists of _____ diodes and _____ switches in anti-parallel.

a) 2, 2	b) 3, 3	c) 4, 4	d) 3, 4

Answer: c

18.	For the type E chopper to be operated in the fourth quadrant

a) only one switch is operated	b) two switches are operated	c) three switches are operated	d) all the switches are operated

Answer: a

19.	Find the expression for the ripple factor in terms of duty cycle α for a type A step down chopper

a) √(1-α/α)	b) α²/2	c) √α/2	d) √(1-α)

Answer: a

20.	In a type E chopper, if all the four chopper switches are closed simultaneously then

a) load is short circuited	b) supply is short circuited	c) both load and supply are shorted	d) none of the mentioned.

Answer: b

21.	A type A step down chopper has Vs = 220 V and is connected to RLE load. With R = 1 Ω, E = 24 V and L large enough to maintain continuous conduction. Find the average value of load current for a duty cycle of 30 %.			
	a) 100 A	b) 22 A	c) 42 A	d) d) 16.5 A
	Answer: c			
22.	The process of commutating a SCR by applying a reverse voltage to an SCR through a previously charged capacitor is called as			
	a) capacitor commutation	b) forced commutation	c) voltage commutation	d) current commutation
	Answer: c			
23.	Which type of commutation circuit does not work on no load?			
	a) Voltage commutation	b) Current commutation	c) Both voltage and current commutation	d) None of the mentioned
	Answer: a			
24.	For a type D chopper, if duty cycle α < 0.5 then the			
	a) average voltage is positive	b) average voltage is negative	c) average voltage is zero	d) none of the mentioned
	Answer: b			
25.	A type C chopper can operate in			
	a) I st and II nd quadrants	b) II nd and III rd quadrants	c) I st, II nd and III rd quadrants	d) all the four quadrants
	Answer: d			
26.	Identify the converter topolpgy from the figure below (i) (ii)			
	a) (i) Forward Converter(ii) flyback converter	b) (i) flyback converter (ii) Forward Converter	c) both are Forward Converter	d) both are flyback converter
	Answer: d			
27.	How many levels can be produced in the output voltage waveform of single unit of H-Bridge?			
	a) 2	b) 3	c) 4	d) 5
	Answer:b			

28.	How many D.C. sources are required in construction of 5 Level CHB?			
	a) 1	b) 2	c) 3	d)4
	Answer: b			

29.	In a flyback converter, the inductor of the buck-boost converter has been replaced by a			
	a). Flyback capacitor	b)Flyback resistor	c)Flyback transformer	d) Flyback transistor
	Answer: c			

30.	In cascaded H-Bridege inverter the units of H-Bridge are connected in _____	In cascaded H-Bridege inverter the units of H-

Bridge are connected in ――――――――― (a) Series manner (b) Pa

rallelManner (c) Combination of Series and Parallel (d

				) T h e y a r e k e p t S e p a r a t e
a Series manner	b) Parallel Manner	**c)** Combination of Series and Parallel	**d)** They are kept Separate	

Answer:a

UNIT – 4 - INVERTERS & UPS

1.	In a VSI (Voltage source inverter)			
	a) the internal impedance of the DC source is negligible	b) the internal impedance of the DC source is very very high	c) the internal impedance of the AC source is negligible	d) the IGBTs are fired at 0 degrees.
	Answer: a			
2.	Line-commutated inverters have			
	a) 22 V	b) AC on both supply and load side	c) DC on both supply and load side	d) DC on the supply side and AC on the load side
	Answer: b			
3.	_____ based inverters do not require self-commutation.			
	a) IGBT	b) GTO	c) PMOSFET	d) SCR
	Answer: d			

4.	VSIs using GTOs are turned off by			
	a) load commutation	b) line commutation	c) applying a negative gate pulse	d) removing the base signal
	Answer: c			
5.	Single phase half bridge inverters requires			
	a) two wire ac supply	b) two wire dc supply	c) three wire ac supply	d) three wire dc supply
	Answer: d			
6.	In a single-phase half wave inverter _____ SCR(s) are/is gated at a time.			
	a) one	b) two	c) three	d) none of the mentioned
	Answer: a			
7.	The output of a single-phase half bridge inverter on R load is ideally			
	a) a sine wave	b) a square wave	c) a triangular wave	d) constant dc
	Answer: b			
8.	The output current wave of a single-phase full bridge inverter on RL load is			
	a) a sine wave	b) a square wave	c) a triangular wave	d) constant dc
	Answer: c			
9.	Single-phase full bridge inverters requires			
	a) 4 SCRs and 2 diodes	b) 4 SCRs and 4 diodes	c) 2 SCRs and 4 diodes	d) 2 SCRs and 2 diodes
	Answer: b			
10.	In VSI (voltage source inverters)			
	a) both voltage and current depend on the load impedance	b) only voltage depends on the load impedance	c) only current depends on the load impedance	d) none of the mentioned
	Answer: c			
11.	_____ is the measure of the contribution of any individual harmonic to the inverter output voltage.			
	a) THD	b) Distortion Factor	c) Harmonic Factor	d) TUF
	Answer: c			
12.	The HF (Harmonic factor of nth harmonic) is the ratio of			
	a) an average and a rms value	b) a rms and an average value	c) two volt-ampere values	d) two rms values

	Answer: d
13.	The distortion factor (μ) is the ratio of

a) total rms output voltage to fundamental rms output voltage	b) fundamental rms output voltage to fundamental average output voltage	c) total rms output voltage to rms value of all the harmonic components	d) fundamental rms output voltage to total rms output voltage

	Answer: d
14.	What would be the harmonic factor of lowest order harmonic in case of a half wave bridge inverter?

a) 1/1	b) 1/3	c) 1/2	d) Insufficient data

Answer: b

15.	Forced commutation requires

a) a precharged inductor	b) a precharged capacitor	c) an overdamped RLC load	d) a very high frequency ac source

Answer: b

16.	What is the peak value of phase voltage in case of 3-phase VSI with 180° mode. The supply side consists of a constant dc voltage source of Vs.

a) Vs	b) 3Vs/2	c) 2Vs/3	d) 3Vs

Answer: c

17.	The 120° mode of operation of a three phase bridge inverter requires _____ number of steps.

a) 2	b) 4	c) 6	d) 8

Answer: c

18.	If T1 is gated at 0 °, T3 and T5 will start conducting at _____ and _____ respectively.

a) 180°, 270°	b) 120°, 240°	c) 180°, 300°	d) 240°, 360°

Answer: b

19.	The external control of ac output voltage can be achieved in an inverter by

a) connecting a cyclo-converter	b) connecting an ac voltage controller between the output of the inverter and the load	c) connecting an ac voltage controller between the dc source and inverter	connecting an ac voltage controller between the load and the dc source

Answer: b

20.	In the series-inverter control method

	a) two inverters are connected back-to-back	b) the output from the inverter is taken serially	c) output voltages of two inverters are summed up with the help of a transformer	d) output voltages of two inverters are summed up with the help of a third inverter
	Answer: c			
21.	External control of dc input voltage can be obtained by the use of a			
	a) a) transformer	b) b) chopper	c) inverter	d) converter
	Answer: b			
22.	In the PWM method			
	a) external commutating capacitors are required	b) more average output voltage can be obtained	c) lower order harmonics are minimized	d) higher order harmonics are minimized
	Answer: c			
23.	In pulse width modulation			
	a) the output voltage is modulated	b) the input voltage is modulated	c) the gating pulses are modulated	d) none of the mentioned
	Answer: c			
24.	In current source inverters (CSIs)			
	a) the amplitude of the output current is independent of the load	b) the amplitude of the output current dependents on the load	c) the amplitude of the output voltage is independent of the load	d) none of the mentioned
	Answer: a			
25.	In current source inverters			
	a) L filter is used after the CSI (load side)	b) L filter is used before the CSI (input side)	c) C filter is used after the CSI (load side)	d) C filter is used before the CSI (input side)
	Answer: b			
26.	Force-commutated CSIs need			
	a) a) capacitors for their commutation	b) inductors for their commutation	c) diodes for their commutation	d) none of the mentioned
	Answer: a			
27.	Which of the following is used as a harmonic reduction technique in inverters?			

	a) Amplitude modulation	b) Cycloconverter control	c) Transformer connection	d) Series connection of two inverters
	Answer: c			
28.	Pulses of different widths and heights are superimposed in case of _____ harmonic reduction technique.			
	a) transformer connection	b) pulse width modulation	c) stepped-wave inverter	d) none of the mentioned
	Answer: c			
29.	In three-level modulation			
	a) the output voltage is zero in the first half cycle.	b) the output voltage either zero or positive in the first half cycle.and curve resistance	c) the output voltage either zero or negative in the first half cycle.	d) the output voltage either zero, positive or negative in the first half cycle.
	Answer: d			
30.	n case of sinusoidal pulse width modulation with MI < 1, the order of the dominate harmonic can be raised by			
	a) increasing the number of pulses	b) reducing the number of pulses	c) lowering the input voltage frequency	d) raising the input voltage frequency
	Answer: a			

UNIT – 5 - AC TO AC CONVERTERS

1.	Earlier then the semiconductor technology, _____ devices were used for voltage control applications.			
	a) cycloconverters	b) vacuum tubes	c) tap changing transformer	d) induction machine
	Answer: c			
2.	A single-phase half wave voltage controller consists of			
	a) one SCR is parallel with one diode	b) one SCR is anti parallel with one diode	c) two SCRs in parallel	d) two SCRs in anti parallel
	Answer: b			
3.	In the integral cycle control method of ac voltage controller			

	a) the average power delivered to the load is controlled	b) the instantaneous power delivered to the load is controlled	c) the frequency of output voltage is controlled	d) none of the mentioned
	Answer: a			
4.	A single phase voltage controller has input of 230 V and a load of 15 Ω resistive. For 6 cycles on and 4 cycles off, determine the rms output voltage.			
	a) 189 V	b) 260 V	c) 156V	d) 178 V
	Answer: d			
5.	Pulse gating is suitable for			
	a) R loads only	b) R and RL loads	c) RL loads only	d) all types of loads
	Answer: a			
6.	The ac voltage controller can be used for			
	a) Lighting and heating control	b) On – line transformer tap changing	c) . Soft starting	**d.** All of these
	Answer: d			
7.	Sequence control of ac voltage controllers is employed for the improvement of_____			
	a) output frequency	b) input frequency	c) commutation	d) system power factor
	Answer: d			
8.	The principle of three phase cycloconverter is to			
	a) add and remove number of SCRs	b) vary progressively the firing angle of the devices	c) keep the firing angle as 0° for all the devices	d) none of the mentioned
	Answer: b			
9.	The single phase bridge type cycloconverter uses _____ number of SCRs.			
	a) 4	b) 8	c) 6	d) none of the mentioned
	Answer: b			
10.	In a N-stage sequence controller, each secondary is rated for _____			
	a) n x Vs	b) Vs	c) Vs/n	d) Vs x (n-1)
	Answer: c			
11.	A cycloconverter is a			

a) one stage power converter	b) one stage voltage converter	c) one stage frequency converter	d) none of the mentioned
Answer: c			

12.	A two stage sequence control is			
	a) two SCRs in anti parallel	b) two voltage controllers in parallel	c) two voltage controllers in series	d) a voltage controller having two voltage level
	Answer: b			

13.	High frequency gating uses a			
	a) train of pulses	b) continuous gating block	c) carrier signal	d) none of the above
	Answer: a			

14.	SMPS is used for			
	a) obtaining controlled ac power supply	b) obtaining controlled dc power supply	c) storage of dc power	d) switch from one source to another
	Answer: b			

15.	In a three phase half-wave cycloconverter _____			
	a) both inverting and converting action takes place	b) only inversion action takes place	c) only converting action takes place	d) none of the mentioned
	Answer: a			

16.	SPMS are based on the _____ principle.			
	a) Phase control	b) Integral control	c) Chopper	d) MOSFET
	Answer: c			

17.	_____ is used for critical loads where temporary power failure can cause a great deal of inconvenience.			
	a) SMPS	b) UPS	c) MPS	d) RCCB
	Answer: b			

18.	._____ is used in the rotating type UPS system to supply the mains.			
	a) DC motor	b) Self excited DC generator	c) Alternator	d) Battery bank
	Answer: c			

19.	Static UPS requires _____			
	a) only rectifier	b) only inverter	c) both inverter and rectifier	d) none of the mentioned
	Answer: c			

20.	No discontinuity is observed in case of			
	a) short break static UPS configuration	b) long break static UPS configuration	c) no break static UPS configuration	d) rotating type UPS configuration
	Answer: c			

21.	Two six pulse converters used for bipolar HVDC transmission system, are rated at 1000 MW, +- 200 kV. What is the dc transmission voltage?			
	a) 200 kV	b) 400 kV	c) 500 kV	d) 100 kV
	Answer: b			

22.	n HVDC transmission lines			
	a) both the stations operate as an inverter	b) both the stations operate as a converter	c) one acts as a converter and other as an inverter	d) depends upon the type of the load
	Answer: c			

23.	HVDC transmission has _____ as compared to HVAC transmission.			
	a) smaller transformer size	b) smaller conductor size	c) higher corona loss	d) smaller power transfer capabilities
	Answer: b			

24.	For high power applications _____ are used as static switches whereas for low power applications _____ are used.			
	a) Transistors, SCRs	b) SCRs, transistors	c) Diodes, transistors	d) SCRs, diodes
	Answer: b			

25.	Solid State Relays (SSRs) have			
	a) moving parts	b) no moving parts	c) a coil	d) a contactor
	Answer: b			

26.	TRIAC is used in			
	a) chopper	b) speed control of induction machine	c) speed control of universal motor	d) none of the mentioned
	Answer: c			

| 27. | Induction heating is a _____ type of heating | | | |

	b) zero frequency	b) high frequency	c) power frequency	d) none of the mentioned
	Answer: b			
28.	The factors governing the induction heating are			
	a) resistivity	b) relative permeability	c) magnetic field intensity	d) Cools below 0°C
	Answer: d			
29.	_____ can be used as a single phase static ac switch.			
	a) Diode	b) SCR	c) DIAC	d) TRAIC
	Answer: d			
30.	Solid State Relays (SSRs) have a			
	a) coil and contact arrangement	b) optocoupler	c) scr	d) none of the mentioned
	Answer: b			