Course/Branch : BE/EEE	**Year / Semester** :III/V	Format No.	NAC/TLP-07a.13
Subject Code :EE8553	**Subject Name** :Power Electronics	Rev. No.	02
Unit No :2	**Unit Name** :Phase controlled converters	Date	30.09.2020

OBJECTIVE TYPE QUESTION BANK

S. No.	Objective Questions (MCQ /True or False / Fill up with Choices)	BTL
1	In a three-phase half-wave rectifier, each diode conducts for a duration of **A) 120°** B) 180° C) 90° D) 60°000	L2
2	A fully controlled natural commutated 3-phase bridge rectifier is operating with a firing angle α = 30°. The peak to peak voltage ripple expressed as a ratio of the peak output dc voltage at the output of the converter bridge is A) √3/2 B) 2/√3 C) 1 **D) 0.5**	L3
3	A three-phase, three-pulse, M-3 type controlled converter uses _____ number of SCRs. A)1 **B) 3** C) 2 D) 4	L3
4	A three-phase, three-pulse, M-3 type controlled converter has firing angle for one of the SCRs set as 15°. This SCR would start conducting at A) 0° B) 15° C) 30° **D) 45°**	L3
5	In a three-phase, three-pulse, M-3 type controlled converter T1 starts to conduct at 30 + n°. At what angles do T2 and T3 start to conduct? Assume that the conduction sequence is T1-T2-T3. A**)** 2n° and 3n° **B) 150 + n° and 270 + n°** C) n° each D) 30 + n° and 60 + n°	L3
6	A three-phase three pulse type controlled converter is constructed using 3 SCR devices. The circuit is supplying an R load with α < 30°. As such, each SCR device would conduct for A) 180° each cycle **B) 120° each cycle** C) 360° each cycle D) 60° each cycle	L2
7	In the circuit shown below, SCR T1 conducts first. If T1 is fired at an angle of α > 30°, then T1 would conduct from	L3

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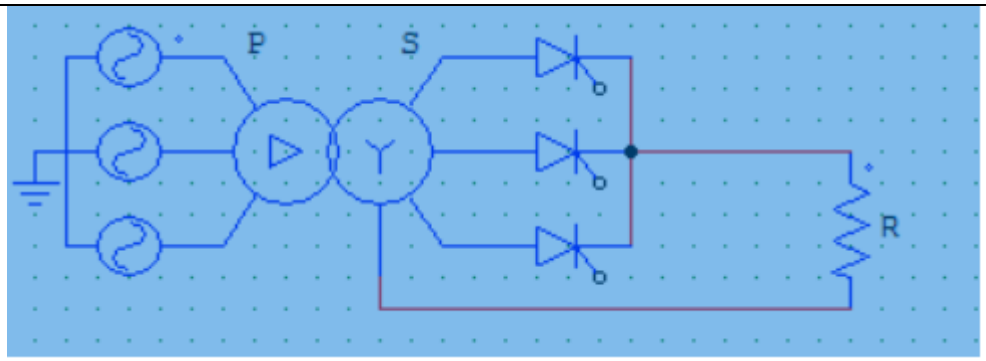
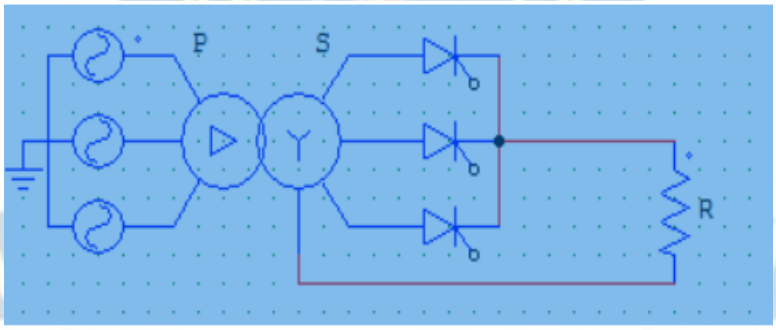
	 A) α to 180° B) 30 + α to 180° C) 30 + α to 150° D) 30 + α to 120°	
8	Find the expression for average output voltage for the given circuit if firing angle is greater than 30°. Take Vmp = secondary side maximum value of phase voltage.  A) (3√3Vmp/2π) x cosα **B) (3√3Vmp/2π) x [1+cos(30+α)].** C) (3√3Vmp/2π) x (1+cosα) D) (3√3Vmp/2π) x [3+cos(30+α)].	L3
9	In a 3-phase semi-converter, firing angle is less than 60°, as such each SCR and diode conduct respectively for _____ (in degrees) A) 60, 60 **B) 120, 120** C) 90, 30 D) 180, 180	L2
10	A fully controlled converter uses A) both diodes and thyristors **B) thyristors only** C) diodes only D) none of the mentioned	L2
11	A single phase full-converter using R load is a _____ quadrant converter and that using an RL load without FD is a _____ quadrant converter A) one, one **B) one, two** C) two, one	L2

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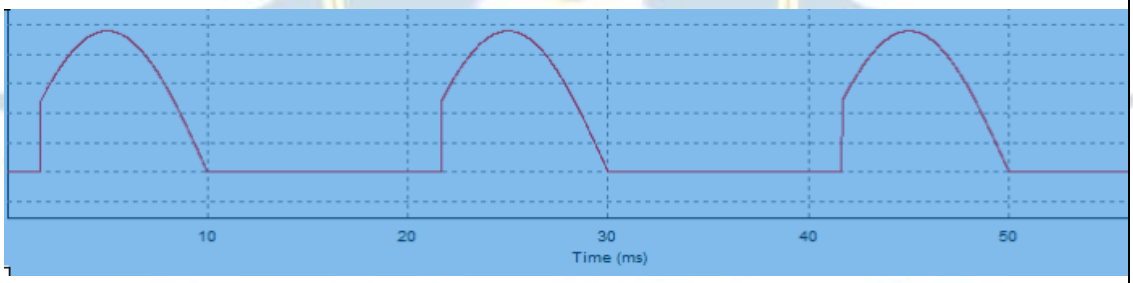
	D) two, two	
12	A single phase full controlled bridge converter (B-2) uses A) 4 SCRs and 2 diodes B) 6 SCRs C) 4 SCRs and 4diodes **D) 4 SCRs**	L2
13	In a Bridge type full controlled bridge converter **A) two SCRs conduct at a time** B) three SCRs conduct at a time C) four SCRs conduct at a time D) one SCRs conduct at a time	L2
14	The average output voltage is maximum when SCR is triggered at ωt = **A) 0** B) π C) π/2 D) π/4	L2
15	For a certain SCR configuration, the below shown waveform is obtained. Find the value of the average output voltage with α = 30° & Vs = 240 V.  **A) 100.8 V** B) 50.27 V C) 100 D) 120	L3
16	In the process of diode based rectification, alternating input voltage is converted into a) an uncontrolled alternating output voltage **b) an uncontrolled direct output voltage** c) a controlled alternating output voltage d) a controlled direct output voltage	L2
17	In a half-wave rectifier, the a) current & voltage both are bi-directional b) current & voltage both are uni-directional **c) current is always uni-directional but the voltage can be bi-directional or uni-directional** d) current can be bi-directional or uni-directional but the voltage is always uni-directional	L2

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18	For a certain diode based rectifier, the output voltage (average value) is given by the equation $1/2\pi$ [$\int$Vm sin ωt d(ωt)] Where the integral runs from 0 to π The rectifier configuration must be that of a a) single phase full wave with R load b) single phase full wave with RL load **c) single phase half wave with R load** d) single phase half wave with RL load	L3
19	For a single phase half wave rectifier, with R load, the diode is reversed biased from ωt = a) 0 to π, 2π to $2\pi/3$ **b) π to 2π, $2\pi/3$ to 3π** c) π to 2π, 2π to $2\pi/3$ d) 0 to π, π to 2π	L2
20	In a 1-Phase HW diode rectifier with R load, the average value of load current is given by Take Input (Vs) = Vm sinωt a) Vm/R b) Vm/2R **c) Vm/πR** d) Zero	L2
21	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**	L2
22	A single-phase symmetrical semi-converter employs **a) one SCR and one diode in each leg** b) two SCRs and two diodes in each leg c) two SCRs in each leg d) two diodes in each leg	L2
23	A single-phase asymmetrical semi-converter employs a) one SCR and one diode in each leg **b) two SCRs in one leg and two diodes in the other** c) two SCRs in both the legs d) two diodes in both the legs	L2
24	Dual converters provide a) two quadrant operation b) three quadrant operation **c) four quadrant operation** d) none of the mentioned	L2
25	A dual converters has a) two full converters in series b) two half converters in series **c) two full converters in anti-parallel**	L2

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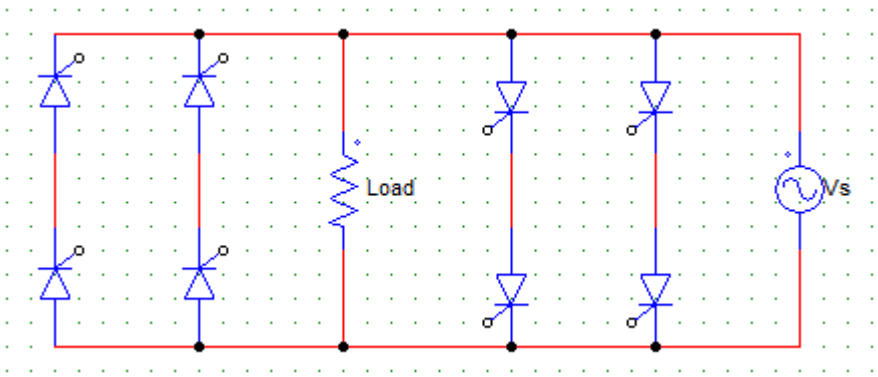
	d) two half converters in anti-parallel	
26	The major advantage of using dual converters is that a) it is cheaply available b) it has better pf **c) no mechanical switch is required to change the mode of operation** d) its operating frequency is very high	L2
27	Find the error in the below given dual converter circuit.  i) Load is not connected in the right position ii) Only 4 SCRs must be used iii) Voltage source is not connected for one of the converter circuit iv) Voltage source is not connected in the proper place a)All 4 b) Both (i) and (iv) **c) Both (iii) and (iv)** d) Both (ii) and (iii)	L3
28	In case of controlled rectifiers, the nature of the load current (continues or discontinuous) depends upon the **a) type of load and firing angle** b) only on the type of load c) only on the firing angle d) it is independent of all the parameters	L2
29	For a single phase half-wave thyristor circuit with R load, the power delivered to the resistive load is a) (average load voltage) x (average load current) b) (rms supply voltage)2/R **c) (rms load voltage)2/R** d) (average load voltage)/R	L2
30	For a single phase half-wave thyristor circuit with R load, the input power factor is given by a) rms source voltage/total rms line current b) rms input power/power delivered to the load c) cos α **d) power delivered to load/input VA**	L2