



## **BRAINWARE UNIVERSITY**

## **Term End Examination 2022** Programme - B.Tech.(ECE)-2019/B.Tech.(ECE)-2020

**Course Name – Power Electronics** Course Code - PEC-ECEL501B

(Semester V)

LIBRARY Brainware University Barasat, Kolkata -700125

Full Marks: 60

Time: 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A (Multiple Choice Type Question) 1 x 15=15 1. Choose the correct alternative from the following: (i) In a single phase half-wave thyristor circuit with R load if Vs = Vmsinii‰t, the maximum value of the load current can be formulated as a) 2Vm/R ' b) Vs/R c) Vm/2 d) Vs/2 (ii) discuss, In any AC-DC circuit, the freewheeling action a) improves the power handling capabilities b) increases the Total Harmonic Distortion c) improves Current Distortion Factor d) all of these (iii) In anticipate 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 (iv) In converter operation, with output voltage = Vo and RLE load a) Vo < E b) Vo = Ec) Vo > E d) None of these (v) The commutation period when both incoming and outgoing SCRs are conducting due to source inductance is justify as a a) conduction delay b) overlap period c) one on one period d) distorting angle (vi) Choose, Which device can be used in a chopper circuit? a) BJT b) MOSFET c) GTO d) All of these (vii) state, Which terminal does not belong to the SCR? a) Anode b) Gate

(viii) A step - down choppers can be categorized as

a) Electric traction

c) Machine tools

(ix) Choppers is advertise of

d) Cathode

b) Electric vehicles

d) All of these

a) AC - DC converters	b) DC - DC converters	
c) DC - AC converters	d) AC - AC converters	
(x) Step-down chopper is also established as a		
a) first-quadrant chopper	b) second-quadrant chopper	
<ul><li>c) third-quadrant chopper</li><li>(xi) Examine the case-For an SCR in the forward bloom</li></ul>	d) fourth-quadrant chopper	
a) leakage current does not flow	b) leakage current flows from anode to	)
c) leakage current flows from cathode to	cathode d) leakage current flows from gate to a	node
anode (xii) Type C chopper can operate in		
a) Ist and IInd quadrants	b) IInd and IIIrd quadrants	
c) Ist, lind and ilird quadrants	d) all of these	
(xiii) Name the device which has reverse blocking mode the middle junction (J2) has the characteristics of that of a		
characteristics of that of a a) transistor	b) capacitor	
c) inductor	d) none of these	
(xiv) discover, where the load is connected In a silicon controlled rectifier-		
a) Across anode	b) In series with anode	
c) Across cathode	d) In series with cathode	
(xv) In the current limit control method, when the load current develop a predefined lower value, then		
a) the chopper is switched off	b) the chopper is switched on	
c) the source voltage is removed	d) load voltage goes to zero	
Group-B		
(Short Answer Type Questions) 3 x 5=15		
2. Show how switching loss in power MOSFET is laser than that in a power BJT. (3)		(3)
3. Sketch the layer structure diagram of a TRIAC and Indicate all.		(3)
4. Write, what is the advantages and disadvantages of bridge rectifier over full-wave rectifier (3) using two diodes.		
5. Write short note on DIAC.	•	(3)
6. Explain switching characteristics of power MOSFET. (3)  OR		(3)
Draw the diagram of buck converter?	•	(3)
Diaw the diagram of back converter.		
Grou		
(Long Answer Typ	pe Questions)	5 x 6=30
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7. Draw and explain the turn on characteristics of Thyristor.		(5) (5)
8. Explain the operation of Single Phase Half Wave Rectifier with RL load.		(5) (5)
<ol> <li>justify. how the Output voltage of a chopper can be controlled?</li> <li>Define, Sinusoidal Pulse Width Modulation with suitable diagram.</li> </ol>		(5)
11. Draw and explain the switching characteristics of SCR.		(5)
12. justify, how the output voltage of a rectifier circuit can be controlled by using a thyristor? (		(5)
OR		(5)
Estimate and discuss the various techniques to co	ontrol the output voltage of a chopper?	(5)