Sanjay Ghodawat University, Kolhapur 2018-19

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017 EXM/P/09/01

Year and Program:2018-19 **School of Technology** **Department of Electrical Engineering**

Course Code: EET 208 **Course Title: Power Electronics** **Semester – IV**

Day and Date: Tuesday, 28/5/2109 **End Semester Examination (ESE)** **Time:10.30 am-1.30 pm**

Max Marks: 100

Instructions:
1) All questions are compulsory.
2) Assume suitable data wherever necessary.
3) Figures to the right indicate full marks.

			Marks	Bloom's Level	CO
Q.1	**Solve any Two**				
	a)	Give comparison between MOSFET & IGBT	07	L_3	CO1
		OR			
	a)	Sketch and discuss briefly switching characteristics of thyristor during its turn on and turn off processes.	07	L_3	CO1
	b)	Describe the operation of a single phase two pulse full wave mid-point converter with relevant voltage and current waveforms. Discuss how each SCR is subjected to a reverse voltage equal to double the supply voltage in case turns ratio from primary to each secondary is unity. Find the circuits turn off time provided to each SCR by this converter configuration.	08	L_3	CO2
		OR			
	b)	Describe the operation of a three phase full wave full controlled bridge converter feeding power to R-L load by showing the waveforms of input line voltage, load voltage for a firing angle of 60^0. Derive also expression for average load voltage.	08	L_3	CO2
Q.2	**Solve any Two**				
	a)	What is DC chopper? Describe the working of type A&C chopper with their waveforms	07	L_2	CO3
		OR			
	a)	Describe the principle of DC chopper operation. Derive an expression for its average output voltage	07	L_2	CO3

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	b)	Describe the three phase to single phase cycloconverter feeding R-L load with output frequency one eighth of input frequency .Illustrate your answer by showing one cycle of low frequency output voltage.	08	L_2	CO4
		OR			
	b)	Describe the basic principle of working of single phase to single phase step up cycloconverter with the help of bridge type configuration. Illustrate your answer with appropriate circuit and waveforms. The conduction of various thyristor must also be indicate on the waveforms.	08	L_2	CO4
Q.3		**Solve any Two**			
	a)	Define string efficiency for series/parallel connected SCR'S .Show that string efficiency of two series connected SCR is usually less than one.	08	L_3	CO1
	b)	For a single phase one pulse controlled converter system sketch waveforms for load voltage and load current for 1)R-L load and 2)R-L load with freewheeling diode across R.From a comparison of these waveforms discuss the advantages of using freewheeling diode.	08	L_3	CO2
	c)	Sketch type B chopper. Does it operate as step down or step up chopper? Explain.	08	L_3	CO3
	d)	Sketch the single phase to single phase step up cycloconverter with the help of midpoint type configuration. Organize your answer with appropriate circuit and waveforms. The conduction of various thyristor must also be indicate on the waveforms.	08	L_3	CO4
Q.4		**Solve any Two**			
	a)	Describe the working of single phase full wave bridge inverter connected to inductive load. Draw the load voltage and load current waveforms. Also indicate the conduction of various elements of inverter circuit	09	L_2	CO5
	b)	Discuss the principle of working of three phase bridge inverter. Draw the relevant waveform considering 120^0 mode of operation and star connected resistive load.	09	L_2	CO5
	c)	Describe the working of single phase half wave bridge inverter connected to resistive load. Draw the load voltage and load current waveforms. Also indicate the conduction of various elements of	09	L_2	CO5

inverter circuit.

Q.5	**Solve any Two**				
a)	Analyze SMPS with a push pull configuration	09	L_4	CO6
b)	What is UPS? Give its industrial application. Describe and compare rotating type ,short break static type UPS configuration	09	L_4	CO6
c)	Describe and compare both types of HVDC links with relevant circuits. Derive equivalent circuit of a HVDC system.	09	L_4	CO6
Q.6	**Solve any Three**			
a)	Explain in detail multiple pulse modulation techniques.	06	L_2	CO5
b)	Describe the working of single phase full wave bridge inverter connected to resistive load. Draw the load voltage and load current waveforms. Also indicate the conduction of various elements of inverter circuit.	06	L_2	CO5
c)	Describe a battery charger with a relevant circuit diagram.	06	L_2	CO6
d)	Explain the working of an emergency lighting system with suitable circuit diagram.	06	L_2	CO6

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