C.U.SHAH UNIVERSITY Summer Examination-2020

Subject Name: Power Electronics II Subject Code: 4TE07PEL1 Semester : 7 Date : 25/02/2020

Branch: B.Tech (Electrical) Time : 10:30 To 01:30

Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.

- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Q-1		Attempt the following questions:				
	1)	A Buck converter is also defined as converter.				
		A) Step up-down	B) Step down	C) Step up	D) None of the abov	e
	2)	For a Buck conver	ter, input voltag	ge=75 V, duty	cycle D=0.6, then output v	oltage
		is				
		A) 60 V	B) 75 V	C) 50 V	D) 45 V	
	3)	A flyback converter is also known by an isolated converter.				
		A) Buck-Boost	B) Buck	C) Boost	D) None of the abo	ve
	4)	The number of DC sources required for a Five level cascaded H Bridge inverter				
		is				
		A) One	B) Five	C) Two	D) Three	
	5)	The output voltage	is V _o =			
		A) DV_{in}	B) $\frac{V_{in}}{1-D}$	C) $\frac{1}{D}V$	T_{in} D) $\frac{D}{1-D}V_{in}$	
	6)	In a six pulse rectifier, the average output volltage is greater than a single phase				
		bridge rectifier?				
		A) True I	B) False			
	7)	The DC-DC converter should be operated at a very low switching frequency.				
		A) True	B) False			
	8)	The number of clamping diodes required in a three level diode clamped inverter				
		with one leg is				
		A) Three	B) Five	C) Four	D) Two	



9) In a forward converter if number of turns in a primary winding is equal to number of turns in a demagnetizing winding, then maximum possible value of duty cycle is_____

A) D=0.2 B) D=0.6 C) D=0.8 D) D=0.5

- **10**) Give any two advantages of Zero Current Switching (ZCS) operation in a converter circuit.
- 11) Give any two advantages of multilevel inverter over two level inverter.
- **12**) List any two drawbacks of linear regulated power supply over switch mode power supply.
- 13) What is the necessary condition for series resonant oscillation?
- 14) What are the advantages of parallel resonant inverters?

Attempt any four questions from Q-2 to Q-8

Q-2	(a)	Attempt all questions Draw the circuit diagram of BOOST converter and explain its operation. Draw the	(14) 07
		waveforms of gate pulse applied to the switch, inductor voltage, inductor current,	
		capacitor current, output voltage.	
	(b)	Derive the equation for average output voltage and average input current for BUCK	07
		converter.	
Q-3		Attempt all questions	(14)
	(a)	Draw the circuit diagram of FLYBACK converter and explain its operation. Draw	
		the waveforms of gate pulse, flux, input primary current and output secondary	
		current.	
	(b)	Draw the block diagram of OFF LINE UPS and explain the function of each block.	07
Q-4		Attempt all questions	(14)
	(a)	Draw the circuit diagram and waveforms of single phase full bridge inverter and	07
		explain its operation.	
	(b)	Draw the circuit diagram of single phase five level cascaded H Bridge inverter and	07
		explain its operation . Draw the output voltage waveforms.	
Q-5		Attempt all questions	(14)
	(\mathbf{a})	Draw the singuit diagram of three level diade element inventor with any log and	07

(a) Draw the circuit diagram of three level diode clamped inverter with one leg and07explain its operation. Draw the output voltage waveform of three level inverter



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(b) Draw the circuit diagram of five level diode clamped (neutral clamped) inverter with one leg and explain its operation.Draw the output voltage waveform of five level inverter.

Q-6		Attempt all questions	(14)		
	(a)	Draw the circuit diagram of BUCK converter and explain its operation. Draw the waveforms of gate pulse applied to the switch, inductor voltage, inductor current,			
		capacitor current, and output voltage.			
	(b) Draw the circuit digram of six pulse diode rectifier (three phase full wave bridge rectifier) and waveforms of three phase input voltage, output voltage, output		07		
		current, input current waveform of any one phase and explain its operation with			
		resistive load.			
Q-7		Attempt all questions	(14)		
	(a)	Draw the connections and vector diagram of Y/Z-2 (Star-Zigzag) transformer.	07		
	Show that line voltage of the secondary winding lags the primary line voltage in range of $0^{\circ} < \delta < 30^{\circ}$)		
	(b)	Draw and explain the structure of Switched Reluctance Motor (SRM).	07		
Q-8		Attempt all questions	(14)		
	(a)	Draw the circuit diagram and waveforms of three phase full wave Brushless DC	07		
		motor drive and explain its operation.			

(b) Draw the circuit diagram and waveforms of ZCS (zero current switching) resonant
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dc-dc converter and explain its operation.



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