C. U. SHAH UNIVERSITY
Winter Examination-2022

Subject Name : Power Electronics II

Subject Code : 4TE07PEL1 **Branch: B.Tech (Electrical)**

Semester: 7 **Date: 21/11/2022** **Time: 11:00 To 02:00** **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:** **(14)**

a) In a Buck converter if, Ton $=1_{\mu S}$, $T_{off} = 2_{\mu S}$,then duty cycle D = _____.
A) 0.5 µs B) 2 µs C) 0.33 µs D) 3 µs

b) The DC-DC converter should be operated at a very low switching frequency.
A) True B) False

c) A flyback converter is also known by an isolated _____converter.
A) Boost B) Buck C) Buck-Boost D) None of the above

d) A forward converter is also known by an isolated _____converter.
A) Boost B) Buck C) Buck-Boost D) None of the above

e) Give any two advantages of online UPS over offline UPS.

f) List any four drawbacks of linear regulated power supply over switch mode power supply.

g) For a buck converter to reduce the conduction losses in diode_____.
A) high on - resistance switch can be added in parallel
B) low on - resistance switch can be added in parallel
C) A high on - resistance switch can be added in series

h) The average value of the output voltage in a buck converter is given by
A) $V_0 = V_s$
B) $V_0 = DVs$
C) $V_0 = V_s/D$
D) $V_0 = V_s /(1 - D)$

i) Draw block diagram of Switch mode DC supply.

j) In a steady state operation of DC-DC converter average voltage across the inductor is _____.
A) Finite B) Zero

k) Give any two advantages of multilevel inverter.

l) The number of switches used in a half bridge push pull converter is_____.
A) 4 B) 1 C)2 D) 6

m) Define resonant converter

n) Give any two advantages for increasing the number of pulses in rectifier operation.

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

Q-2		**Attempt all questions**	**(14)**
	A	Draw the circuit diagram of FORWARD converter and explain its operation.	**07**
	B	Draw the block diagram of OFF LINE UPS and explain function of each block.	**07**

Q-3		**Attempt all questions**	**(14)**
	A	Draw the circuit diagram of BUCK-BOOST converter and explain its operation.	**07**
	B	Draw the circuit diagram of FLYBACK converter and explain its operation.	**07**

Q-4		**Attempt all questions**	**(14)**
	A	Explain Bidirectional AC power supplies with diagram.	**07**
	B	Explain ZVS resonant converter with Waveform.	**07**

Q-5		**Attempt all questions**	**(14)**
	A	Draw the connections and vector diagram of Y/Z-1 (Star-Zigzag) transformer.	**07**
	B	Draw and explain six pulse converter.	**07**

Q-6		**Attempt all questions**	**(14)**
	A	Draw the circuit diagram of BUCK converter and explain its operation.	**07**
	B	Draw the circuit diagram of BOOST converter and explain its operation.	**07**

Q-7		**Attempt all questions**	**(14)**
	A	Explain Design of apparent transformer power for half bridge circuit	**07**
	B	Explain 3-level diode clamped capacitor and advantage and disadvantage.	**07**

Q-8		**Attempt all questions**	**(14)**
	A	Explain construction and working of stepper motor drive.	**07**
	B	Drive the equation for DC-link capacitor voltage balancing.	**07**