QP Code: RO20MTECH229 Reg. No | | | | | | | | | | | AR 19

GIET UNIVERSITY, GUNUPUR – 765022

M. Tech (Second Semester Examinations) – October' 2021

MPEPE2031 – SWITCHED MODE AND RESONANT CONVERTERS

(Power Electronics)

Time: 2 hrs Maximum: 50 Marks

(The figures in the right hand margin indicate marks)

PART – A

Q.1. Answer ***ALL*** questions (2 x 10 = 20)

a. Explain the principle of volt second balance in inductors?
b. Define the terms DPF, THD.
c. Explain the concept of Switch utilization factor in three phase inverters.
d. What are the advantages of SMPS over factors controlled rectifiers?
e. Explain the concept of programmed harmonic elimination.
f. What is effect of having more duty cycle and less duty cycle?
g. Discuss flux unbalancing problem.
h. Compare L type ZCS and M type ZCS resonant converters.
i. What are the design considerations of the transformer in the switch mode converter?
j. What is current mode deficiency?

PART – B **(6 x 5 = 30 Marks)**

Answer ***ANY FIVE*** questions Marks

2. Explain square wave switching scheme in inverter and how to achieve the programmed harmonic elimination technique used in square wave pulse switching. (6)

3. Design a Buck-Boost converter circuit having parameters, input voltage =24 V, D=0.4, load resistance =5 ohm, L=20 micro H,C=80 micro F. Determine the output voltage, average inductor current, Maximum and minimum value of inductor current and the output voltage ripple. Assume a switching frequency of 100 kHz. (6)

4. Discuss in detail on the gain characteristics of LC filter and error amplifier in the design of SMPS. (6)

5. With the help of neat circuit diagram and relevant waveforms, discuss the operation of series loaded resonant dc-dc converter in discontinuous current conduction mode. (6)

6. A fly back converter, having 100 and 50 turns in secondary & primary windings respectively, is fed from an input dc voltage of 50V. Find the duty cycle &output voltage if the MOSFET has a switching frequency of 2kHz and the on period is 0.3 ms. (6)

7. Explain the principle operation of a push-pull converter with neat diagrams. (6)

8. Show that average output dc voltage of a full bridge dc-dc converter with Unipolar switching, can be controlled by varying amplitude of reference signal. (6)

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