CBCS Scheme

USN | | | | | | | | | | |

16/17EPS21

Second Semester M.Tech. Degree Examination, June/July 2018
Power Electronic Converters

Time: 3 hrs. Max. Marks: 80

Note: *Answer FIVE full questions, choosing one full question from each module.*

Module-1

1 a. Explain with figure galvanically isolated forward converter. **(08 Marks)**

b. Explain with circuit and relevant waveforms operation of Buck-Boost in d.c steady state. **(08 Marks)**

OR

2 a. Explain with circuit diagram the operation of cuk converter, mentioning its advantages and disadvantages. **(08 Marks)**

b. The average output voltage of the push-pull converter is $V_0 = 24$ volts at a resistive load of $R = 0.8\Omega$. The on state voltage drops of transistors and diodes are $V_t = 1.2$ volts and $V_d = 0.7$ volt respectively. The turn ratio of transformer is $a = N_s / N_p = 0.25$, if the input power is 750 watts. Determine :

i) output current
ii) output power
iii) input voltage
iv) input current
v) the efficiency. **(08 Marks)**

Module-2

3 a. Draw the block diagram of voltage controlled PWM control module and explain its operation. **(08 Marks)**

b. With relevant circuit and waveforms, explain single phase inverter. **(08 Marks)**

OR

4 a. Enumerate the difference between bipolar and unipolar inverter. Explain with waveform the operation of unipolar PWM inverter. **(08 Marks)**

b. Write a note on Asynchronous PWM and space vector modulation. **(08 Marks)**

Module-3

5 a. Draw the circuit of full wave rectifier using centre tapped transformer and explain. **(08 Marks)**

b. Explain the operation of voltage doubler circuit along with its waveforms. **(08 Marks)**

OR

6 a. Draw the circuit diagram of Twelve –pulse rectifier and explain. **(08 Marks)**

b. Explain the operating principle of single phase power factor correction. **(08 Marks)**

Module-4

7 a. Explain class D, DC-DC resonant converter with basic circuit. **(08 Marks)**

b. Explain the process of parallel resonant converter. **(08 Marks)**

OR

8 a. Explain the operation of phase shift modulated DC-DC converter. **(08 Marks)**

b. Write a brief note on :

i) Frequency converter

ii) Selective harmonic elimination. **(08 Marks)**

Module-5

9 a. Explain with relevant circuit and waveforms the operation of 3-phase AC-AC voltage converter having star connected resistive load. **(10 Marks)**

b. Write a note on bi-directional switches used in power electronic converter. **(06 Marks)**

OR

10 a. What are the main advantages of multilevel converters? **(06 Marks)**

b. Explain with sketch multilevel DC-DC converter. **(10 Marks)**

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