

# KERALA TECHNOLOGICAL UNIVERSITY

08 PALAKKAD CLUSTER

Q. P. code :

(pages: 2 )

Name:

Reg No:

FIRST SEMESTER M.TECH. DEGREE EXAMINATION DEC 2015

Power Electronics

Id: 08EE6212

ANALYSIS OF POWER ELECTRONICS CIRCUITS II

Time:3 hours

Max.marks: 60

Answer all six questions. Part 'a' of each question is compulsory.

Answer either part 'b' or part 'c' of each question



Q.no.	Module 1	Marks
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1.a	Explain staircase modulation.	3
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Answer b or c

b	Explain how a sinusoidal output voltage can be generated using space vector modulation based inverter	6
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c	What is Pulse width modulation control of converters? Explain different types of PWM techniques.	6
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Q.no.	Module 2	Marks
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2.a	Explain the concept of power factor improvement of rectifier circuits	3
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Answer b or c

b	Explain symmetric angle control with relevant waveforms.	6
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c	The single phase fully controlled converter uses extinction angle control is connected to 120 V , 50 Hz supply. Load current $I_a$ is negligible and its ripple content is negligible. Turns ratio of transformer is unity. a) Express the input current in Fourier series. Determine the harmonic factor of input current, DF and input PF, b) If delay angle is $\pi/3$ , calculate $V_{dc}$ , $V_{rms}$ , HF,DF and PF	6
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Q.no.	Module 3	Marks
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3.a	Explain Twelve pulse converter	3
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Answer b or c

b	What are single phase series converters? Explain single phase series semi converter with waveforms.	6
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c	Explain the principle of operation of Z source inverter with equivalent circuit and waveforms	6
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Q.no.	<b>Module 4</b>	Marks
4.a	Compare important types of multicarrier modulation methods for multilevel inverters	3

**Answer b or c**

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|---|---|---|
| b | Explain improved diode clamped multilevel inverter with circuit diagram and waveforms | 6 |
| c | Explain flying capacitor multilevel inverter with circuit diagram and waveforms       | 6 |

Q.no.	<b>Module 5</b>	Marks
5.a	What are different current control methods?	4

**Answer b or c**

- |   |  |   |
|---|--|---|
| b | What is the importance of constant frequency current control methods? Explain the important methods to achieve the same. | 8 |
| c | Explain variable band hysteresis control.  | 8 |

Q.no.	<b>Module 6</b>	Marks
6.a	Discuss about the protection issues in matrix converter	4

**Answer b or c**

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|---|--|---|
| b | What are matrix converters? Give its advantages and disadvantages. | 8 |
| c | Explain Venturini method of control for matrix converters.         | 8 |