CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
M.Tech I Semester Supplementary Examinations August-2024

Course Name: Power Converters

(Power Electronics)

Date: 13.08.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks.   **5x4=20M**

1. What is a forced commutation? What are the advantages of forced commutation for ac-dc converters?   4M

2. Derive an expression for output voltage of a three phase fully controlled bridge converter by considering source-inductance.   4M

3. What is DC-DC converter? Mention the Key Specifications of a DC/DC Converter.   4M

4. What is 1-phase AC voltage controller? What are the applications of 1-phase AC voltage controller?   4M

5. Write short notes on current-source inverters.   4M

PART-B

Answer the following. Each question carries TEN Marks.   **5x10=50M**

6. A). Discuss extinction angle control method for power factor improvement of a single phase full-converter.   10M

OR

6. B). A single-phase full-wave converter has a source of 120 V rms at 60 Hz, an RL load where R = 10 Ω and L=100 mH. With delay angle α = 600, (i) verify that the load current is continuous. (ii) determine the dc (average) component of the current. (iii) determine the power absorbed by the load.   10M

7. A). Draw the output voltage waveforms and derive the average and rms voltage expressions of three phase semi converter on discontinuous conduction mode.   10M

OR

7. B). With the help of a neat schematic and waveforms explain the operation of a three phase dual converter.   10M

8. A). Explain the principle of operation and working of buck converter with relevant waveforms in CCM mode.   10M

OR

8. B). With the help of a neat circuit diagram and associated waveforms, discuss the operation of Buck-Boost converter. List the advantages and disadvantages of this type of converter.   10M

9. A). Explain the operation of a Single– phase AC voltage controlled feeding connected with R-L load   10M

OR

9. B). Explain the operation of a three – phase bidirectional AC voltage controlled feeding star connected with resistive load. Draw the output voltage waveform with α = 60° and α = 120°.   10M

(P.T.O..)

10. A). How do you use PWM to inverters? Explain operation of single full bridge inverter with   10M
quasi-square wave pulse width modulation.

OR

10. B). Explain the concept of multilevel inverters. What are their advantages over the   10M
conventional multi pulse inverters? Name some applications of multilevel inverters.

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