



CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations March-2023

Course Name: **POWER CONVERTERS**

(Power Electronics)

Date: 20.03.2023 FN

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 converter? 4M
2. Define conduction angle, Extinction angle and overlap angle. 4M
3. What do you understand by time ratio control of DC-DC Converter? 4M
4. Mention the applications of cyclo-converters and demerits of cyclo-converters. 4M
5. What is pulse-width modulation control of converters and what are the applications? 4M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

6. A). Explain the operation of a single phase fully controlled bridge converter with necessary wave forms and equations for RL load and discuss Discontinuous mode operation. 10M

OR

6. B). Explain the following terms: i) Input power factor, ii) Displacement factor, iii) Harmonic factor and iv) Total harmonic distortion and derive the relation between input p.f. and displacement factor. 10M

7. A). Explain the continuous mode of operation of three phase semi converter connected to RL load with neat diagram and output waveforms. 10M

OR

7. B). Explain the operation of Three phase fully controlled converter in the inversion mode with neat sketches and waveforms? 10M

8. A). Explain with neat power circuit the operation and analysis of buck converter. 10M

OR

8. B). The buck converter has an input voltage $V_s=15V$. The duty cycle is $K=0.4$ and the switching frequency is 25KHz. The filter inductance is $L_2=350\mu H$ and filter capacitance is $C_2=220\mu F$. The energy transfer capacitance is $C_1=400\mu F$ and inductance is $L_1=250\mu H$. The average load current is $I_a=1.25A$. Determine
- i) The average output voltage, V_a
 - ii) The average input current, I_s
 - iii) The peak-to-peak ripple voltage of capacitor C_1 .
 - iv) Ripple current of Inductor L_2 .

(P.T.O..)

9. A). Explain operation of single phase ac voltage controller for RL-load with power circuit and waveforms and derive the output voltage. 10M

OR

9. B). Explain the bridge configurations for a three phase to three phase cyclo converter and write advantages of three phase cyclo-converters. 10M

10. A). Explain 180° conduction mode of operation of 3-phase inverter. 10M

OR

10. B). Explain briefly the following modulation techniques with relative advantages and disadvantages. i) Single pulse PWM, ii) Multiple PWM and iii) Sinusoidal PWM. 10M

H.T No:

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R18

Course Code: B30212



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations March-2023

Course Name: RESEARCH METHODOLOGY & IPR

(Common for all Branches)

Date: 29.03.2023 FN

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 are the qualities of a good researcher? 4M
2. Name the basic principles of research ethics. 4M
3. Write three precautions for writing research report. 4M
4. Explain about trademark. 4M
5. Write the advantages about trade secrets law. 4M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

6. A). What do you mean by research? Explain its significance in modern times. 10M
- OR**
6. B). "Research is much concerned with proper fact finding, analysis and evaluation". Do you agree with this statement? Give reasons in support of your answer. 10M
7. A). Write the principles of ethics in science and engineering Research? 10M
- OR**
7. B). What are the major issues in conducting research? Explain with example. 10M
8. A). Explain the layout of research paper enumerating the various fields in it. 10M
- OR**
8. B). Write the different types of reports, particularly pointing out the difference between a technical report and a popular report. 10M
9. A). Discuss some of the important considerations when commercializing intellectual property. 10M
- OR**
9. B). State the provisions for procedure of registration and assignment of a copyright. 10M
10. A). List at least 10 geographical indications tagged products in India. 10M
- OR**
10. B). Explain new developments in the copyright protection following: Computer programs and Videogames. 10M
