**Homework 4**

**Page 95, Chinese textbook**

**Question 12**

Considering a three-phase bridge fully-controlled rectifier circuit under a resistive load, if one thyristor cannot be conducted, what does the rectifier voltage waveform look like? If one thyristor has been broken down and is a short circuit now, what is the influence on the other thyristors?

**Question 13**

Considering a three-phase bridge fully-controlled rectifier circuit with , under a resistive and inductive load with and very large inductance, when :

1. Draw the waveform of , and ;
2. Calculate , , , and .

**Question 15**

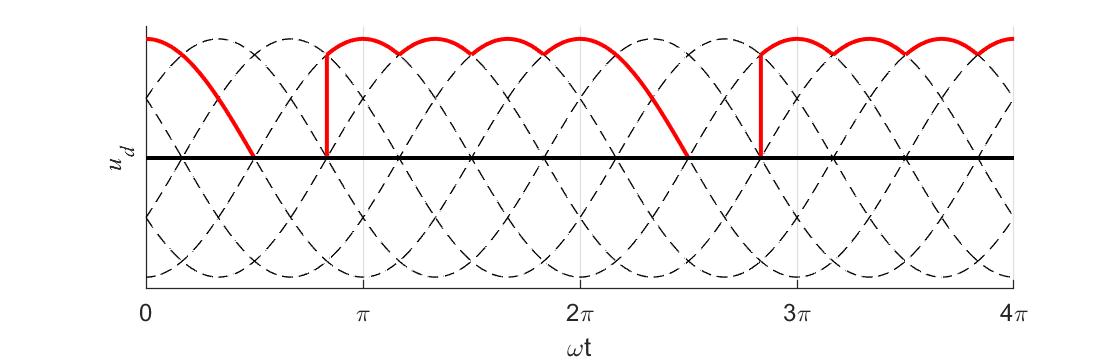
Considering a three-phase half-wave controlled rectifier circuit connected to a EMF load with resistor and inductor, when , , , , , , calculate the value of , , and draw the waveform of , , .

**Question 16**

Considering a three-phase bridge uncontrolled rectifier circuit connected to a resistive and inductive load, with , , , , calculate the value of , , , and , and draw the waveform of , , and .

**Answer 3.12**

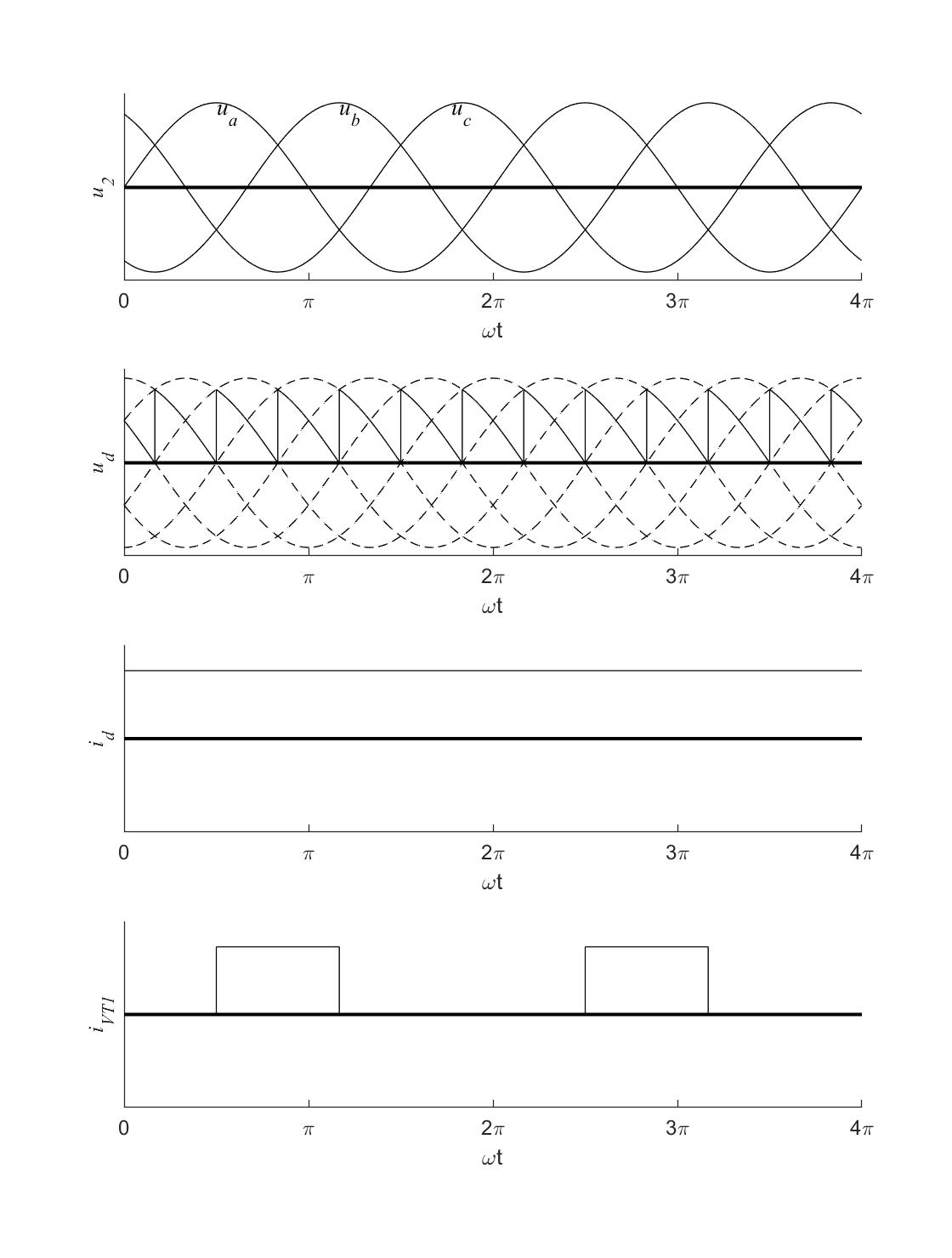
Supposing the VT1 isn’t turned on, the waveform of rectified voltage *ud* is



If the VT1 is broken down to become short circuit and the thyristor VT3 and VT5 is turned on, power is shorted-circuited, which will make the VT3 and VT5 break down.

**Answer 3.13**

1. The waveform of *ud*, *id* and *iVT1*:

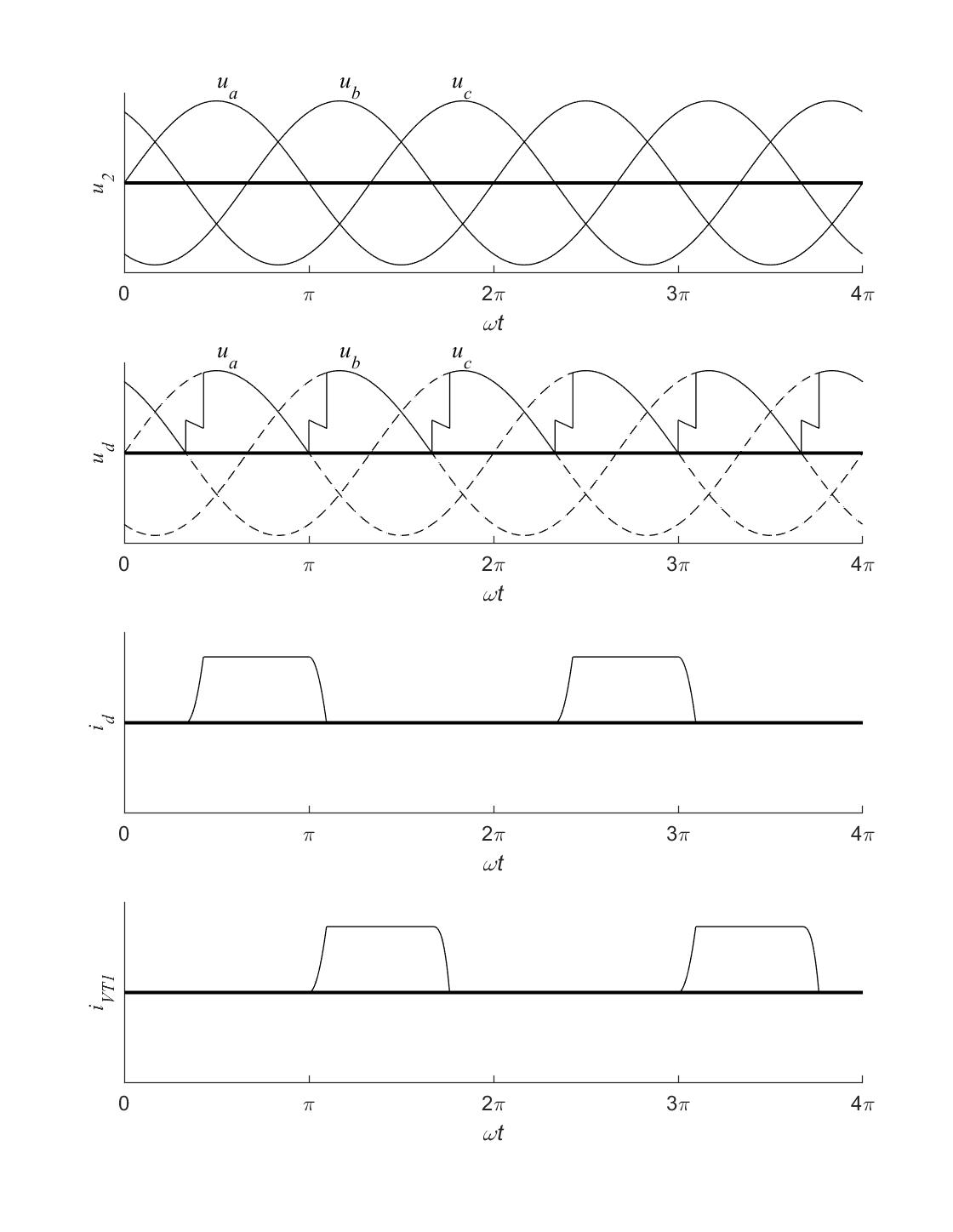


1. The result of , , , and .



**Answer 3.15**

the waveform of , , :



Given that *LB* = 1mH, it’s known that



Solutions of equations are:



We can get the relationship that

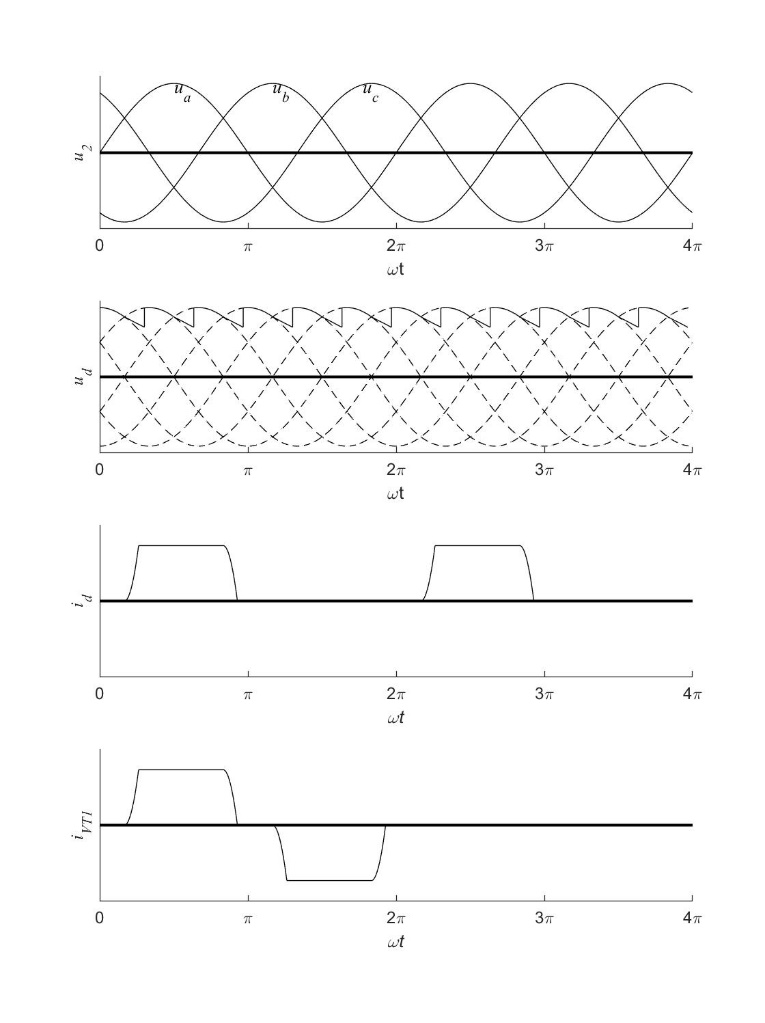


for the reason that



**Answer 3.16**

The waveform of , , and :



A three-phase bridge uncontrolled rectifier circuit is equivalent to A three-phase bridge controlled rectifier circuit with .



Solutions of equations are:



We can get the relationship that



for the reason that



Therefore, the RMS value of the current of diode and the secondary winding of transformer is

