Electronic Circuits – Assignment 04

Diodes applications 3

#	Student ID	Student Name	Grade (10)
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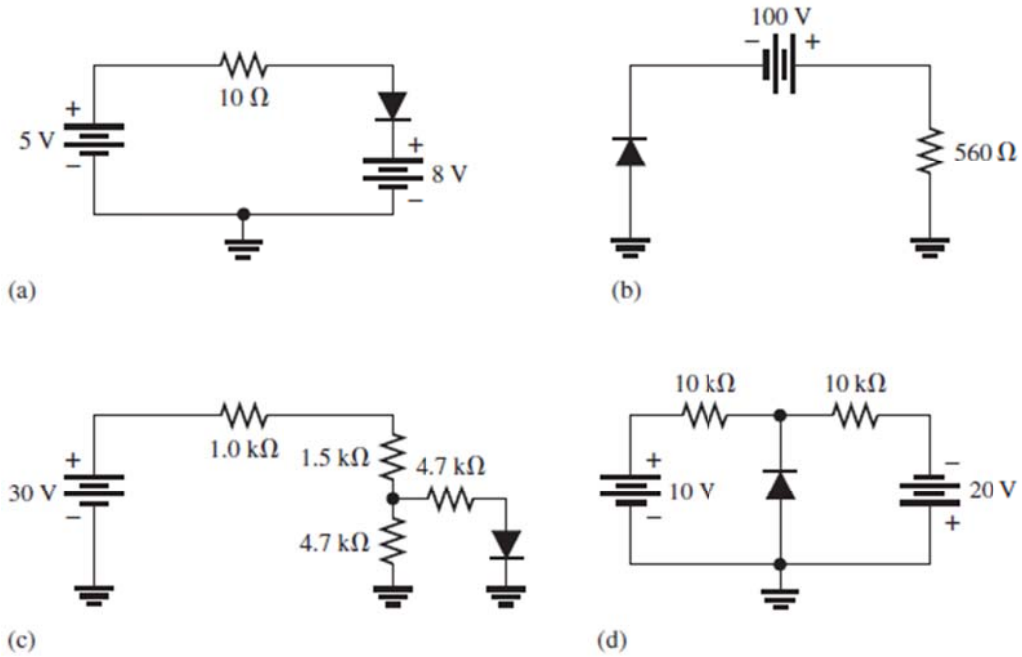
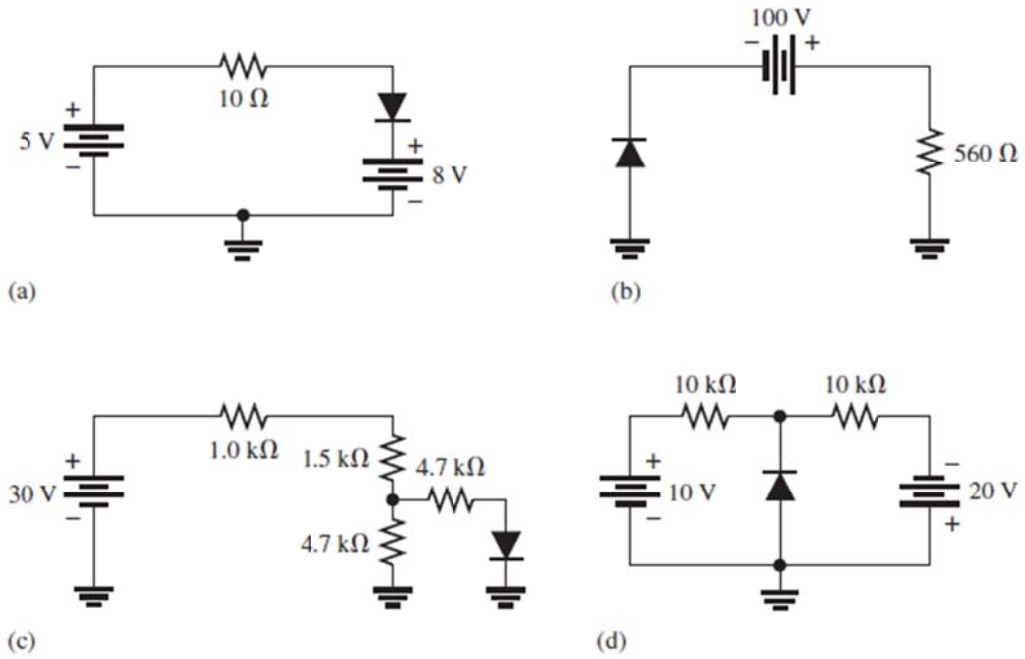
Delivery Date	

1. يتم تسليم التمرين محلولا في خلال أسبوع من تاريخ التمرين، و يتم حذف درجتين من التمرين عن كل أسبوع تأخير
2. يتم التسليم لمعيد المقرر مباشرة
3. تتم أجابه التمرين في نفس ورق الأسئلة

Questions 1

Q1	Determine the voltage across each diode in Figure, assuming the practical model. 
Sol 1	…… …… …… …… …… …… …… …… …… …… …… …… ……

Q2	Determine the voltage across each diode in Figure, using the complete diode model with $r_d = 10\ \Omega$ and $r_R = 100\ M\Omega$. 
Sol 2	…… …… …… …… …… …… …… …… …… …… …… ……

T & F 1

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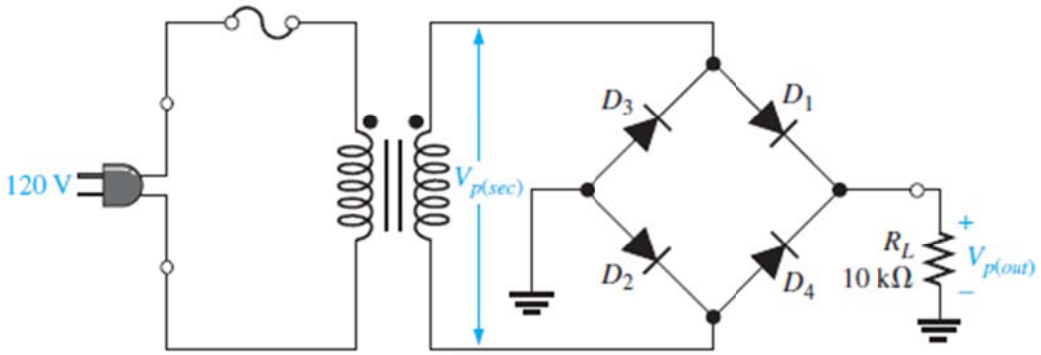
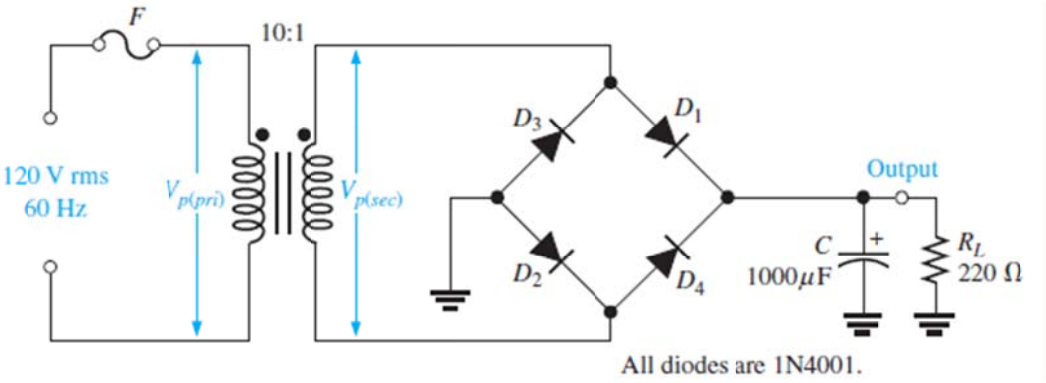
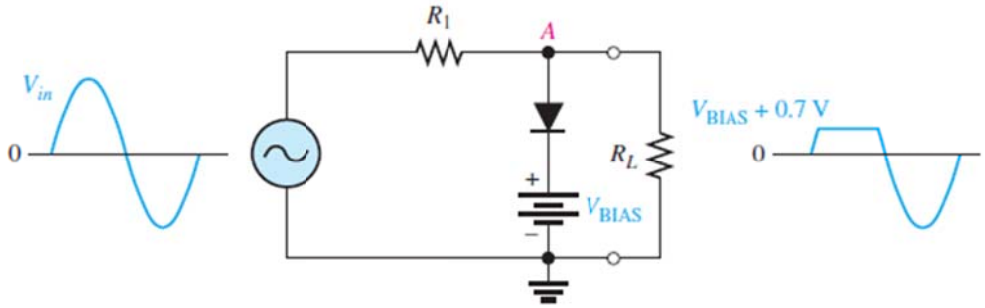
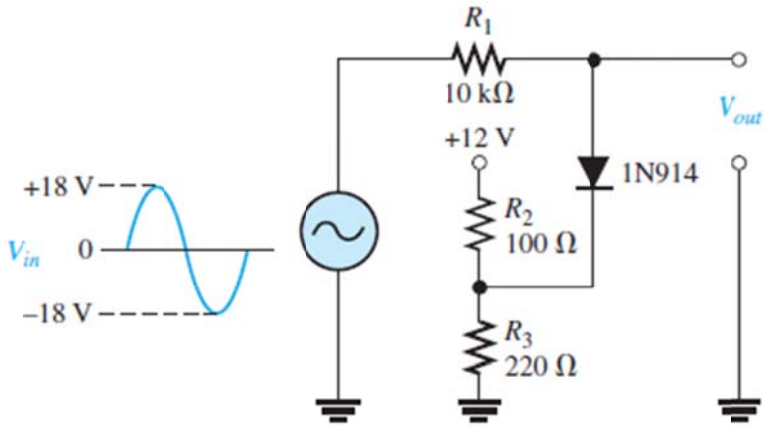
1	A bridge rectifier uses four diodes.	
2	The purpose of the capacitor filter in a rectifier is to convert ac to dc.	
3	A smaller filter capacitor reduces the ripple.	
4	A diode limiter is also known as a clipper.	
5	Voltage multipliers use diodes and capacitors.	

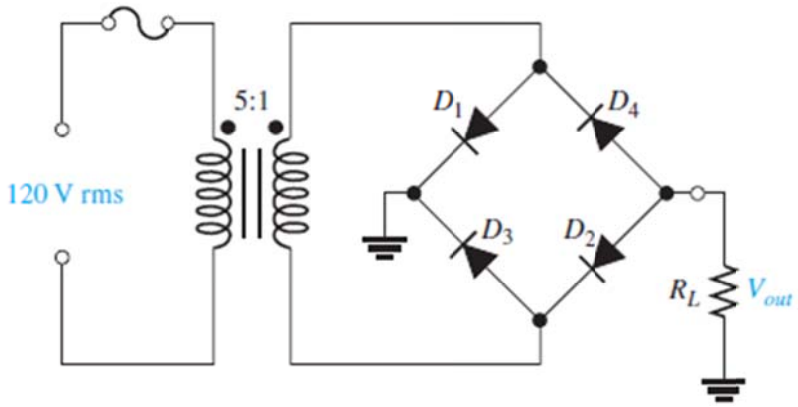
MCQ 1

#	Question	
1	If one of the diodes in Figure opens, the average voltage to the load will  **(a)** increase **(b)** decrease **(c)** not change	
2	If the capacitor value in Figure is decreased, the output ripple voltage will  **(a)** increase **(b)** decrease **(c)** not change	

3	If the bias voltage in Figure is decreased, the positive portion of the output voltage will  **(a)** increase **(b)** decrease **(c)** not change	
4	If the value of *R*3 in Figure is decreased, the positive output voltage will  **(a)** increase **(b)** decrease **(c)** not change	
5	The ideal dc output voltage of a capacitor-input filter is equal to **(a)** the peak value of the rectified voltage **(b)** the average value of the rectified voltage **(c)** the rms value of the rectified voltage	
6	A 60 V peak full-wave rectified voltage is applied to a capacitor-input filter. If f = 120 Hz, RL = 10 k , and C = 10 F, the ripple voltage is **(a)** 0.6 V **(b)** 6 mV **(c)** 5.0 V **(d)** 2.88 V	

7	Line regulation is determined by **(a)** load current **(b)** zener current and load current **(c)** changes in load resistance and output voltage **(d)** changes in output voltage and input voltage	
8	A 10 V peak-to-peak sinusoidal voltage is applied across a silicon diode and series resistor. The maximum voltage across the diode is **(a)** 9.3 V **(b)** 5 V **(c)** 0.7 V **(d)** 10 V **(e)** 4.3 V	
9	In a certain positive clamper circuit, a 120 V rms sine wave is applied to the input. The dc value of the output is **(a)** 119.3 V **(b)** 169 V **(c)** 60 V **(d)** 75.6 V	
10	If the input voltage to a voltage tripler has an rms value of 12 V, the dc output voltage is approximately **(a)** 36 V **(b)** 50.9 V **(c)** 33.9 V **(d)** 32.4 V	
11	When a silicon diode is open, a DMM will generally indicate **(a)** 0 V **(b)** OL **(c)** approximately 0.7 V **(d)** approximately 0.3 V	
12	If one of the diodes in a bridge full-wave rectifier opens, the output is **(a)** 0 V **(b)** one-fourth the amplitude of the input voltage **(c)** a half-wave rectified voltage **(d)** a 120 Hz voltage	

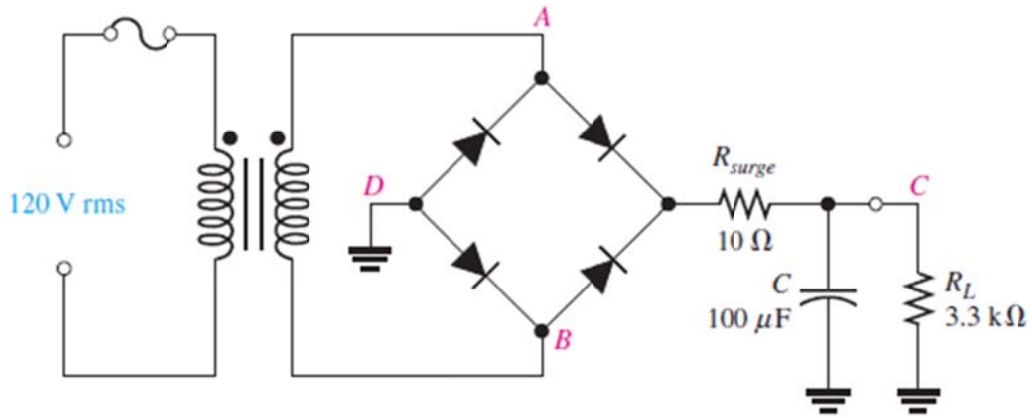
Problems 2

1	The rms output voltage of a bridge rectifier is 20 V. What is the peak inverse voltage across the diodes? 
1	…… …… …… …… …… …… …… …… …… …… …… …… …… …… …… …… …… ……

2	A certain rectifier filter produces a dc output voltage of 75 V with a peak-to-peak ripple voltage of 0.5 V. Calculate the ripple factor.
2	.....

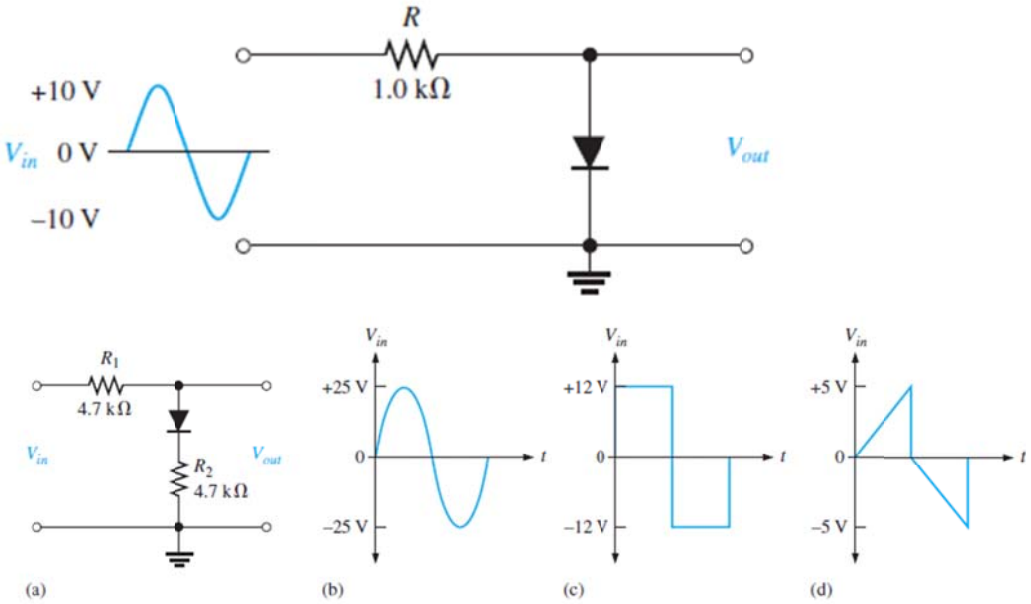
3	A certain full-wave rectifier has a peak output voltage of 30 V. A 50 F capacitor-input filter is connected to the rectifier . What is the percentage of ripple for the rectifier filter
3	.....

4	A full-wave rectifier produces an 80 V peak rectified voltage from a 60 Hz ac source. If a 10 μF filter capacitor is used, determine the ripple factor for a load resistance of 10 kΩ.
4	.....

5	Refer to Figure 2–98 and draw the following voltage waveforms in relationship to the input waveforms: V_{AB}, V_{AD}, and V_{CD}. A double letter subscript indicates a voltage from one point to another. 
5	.....

6	Assume a regulator has a percent load regulation of 0.5%. What is the output voltage at full-load if the unloaded output is 12.0 V?
6	.....

7	Determine the output voltage for the circuit in Figure 2–100(a) for each input voltage in (b), (c), and (d).
7	.....



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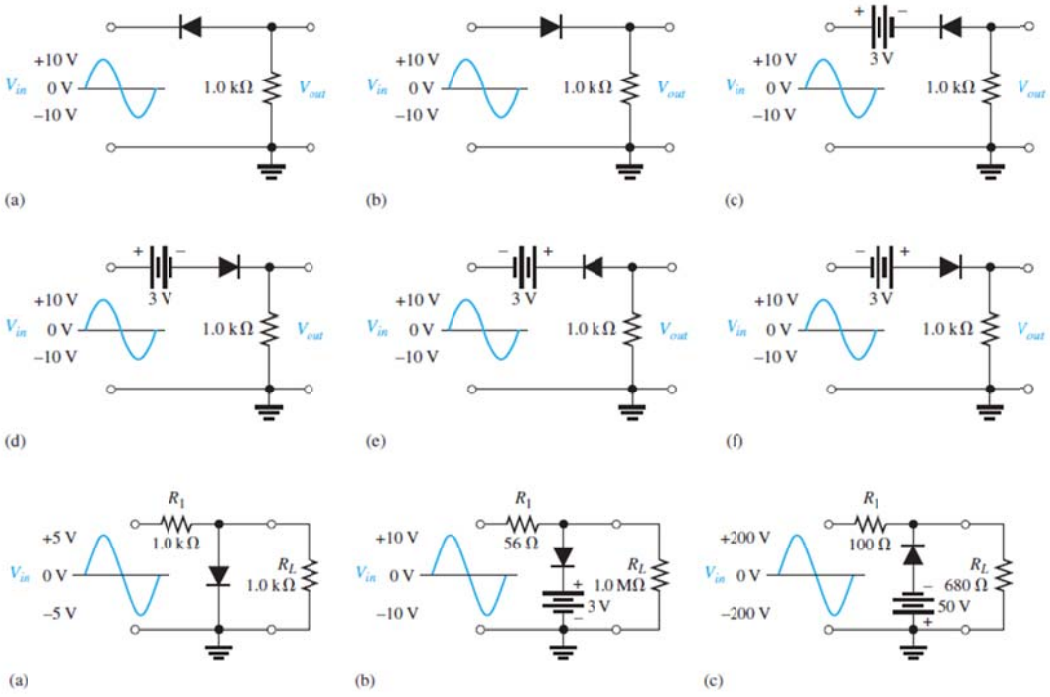
Determine the R_L voltage waveform for each circuit in Figure 2–102.



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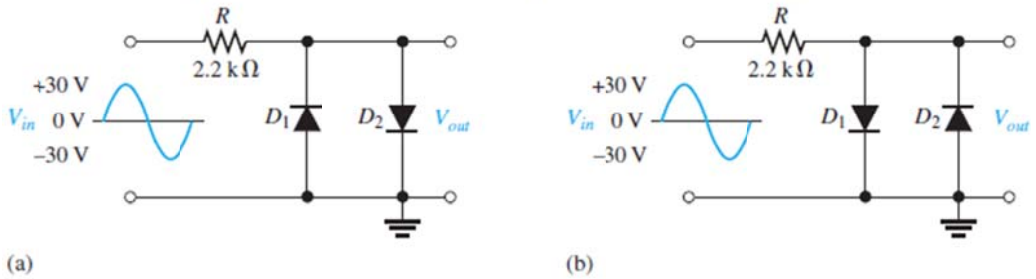
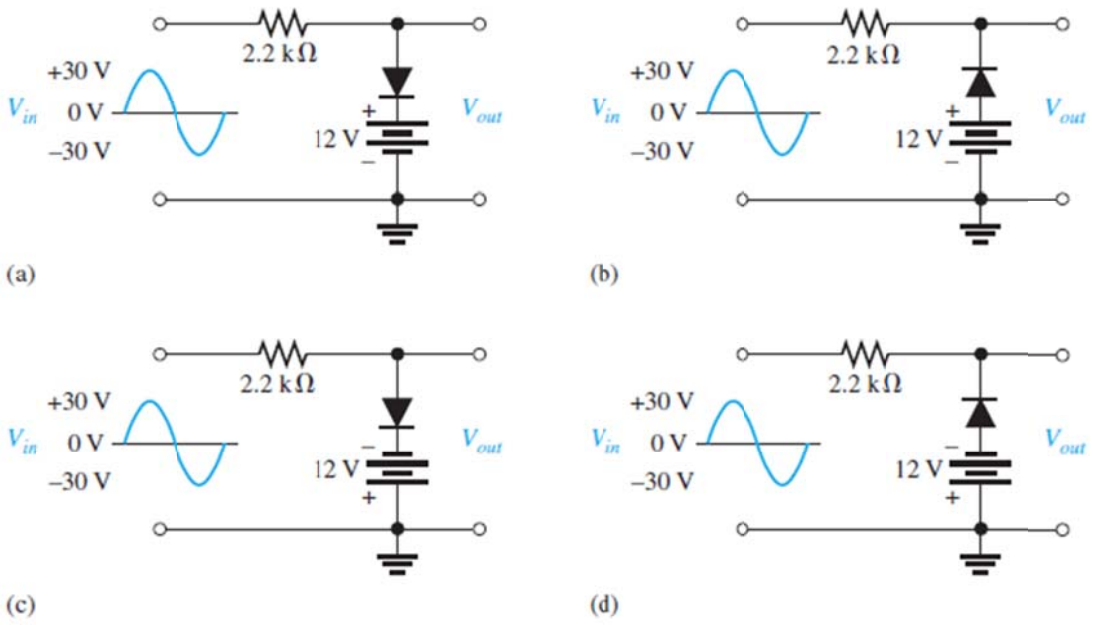
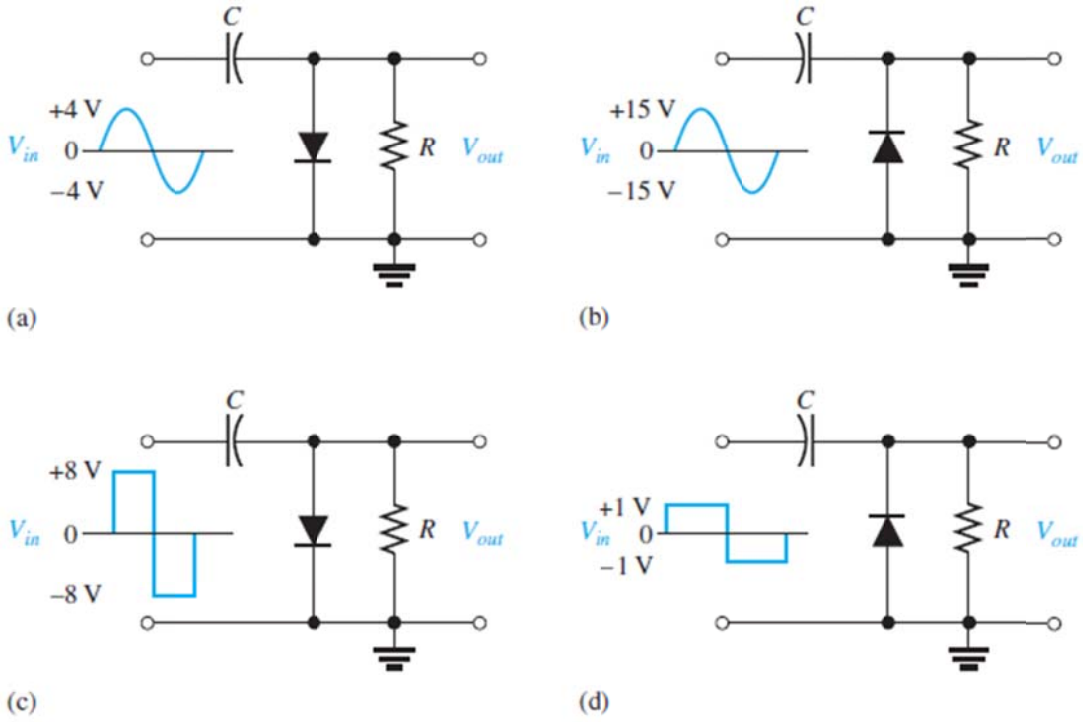
9	Determine the peak forward current through each diode in Figure 2–103. 
9	.....

10	Determine the output voltage waveform for each circuit in Figure 2–104. 
10	…… …… …… …… …… …… …… …… …… …… …… …… …… …… ……

11	Describe the output waveform of each circuit in Figure 2–105. Assume the *RC* time constant is much greater than the period of the input. with the diodes turned around. 
11	…… …… …… …… …… …… …… …… …… …… …… …… …… ……

12	A certain voltage tripler and quadrupler has 20 V rms on its input. What is the output voltage? Draw the circuit, indicating the output terminals and PIV rating for the diode.
12	.....