Name:	ID:	Section:

Assignment 4

BRAC Unviversity

Semester: Fall 20023

Course No.: CSE251	Marks: 130
Course title: Electronic Devices and Circuits	Submission Date: 10/12/2023
Faculty: TMT	

1. Given an input voltage, v_i = 10sin(5000πt). Find the output frequency, output peak voltage, output average/DC voltage for: (CO2) [15+15]

a) Half wave rectifier circuit with diodes with V_T: i) 0.3V ii) 0.5V iii) 0.7V iv) 1V v) 2V

b) Full wave rectifier circuit with diodes with V_T: i) 0.3V ii) 0.5V iii) 0.7V iv) 1V v) 2V

2. With the same input voltage as above and silicon diodes(V_T = 0.7V), now find the output peak voltage, peak to peak ripple voltage, rms ripple voltage, average/DC voltage for: (CO2) [20+20]

a) Half wave rectifier circuit with:

i) R = 1kΩ, C = 1uF

ii) R = 1kΩ, C = 10uF

iii) R = 1kΩ, C = 100uF

iv) R = 1kΩ, C = 1mF

v) R = 1kΩ, C = 10mF

b) Full wave rectifier circuit with:

i) R = 1kΩ, C = 1uF

ii) R = 1kΩ, C = 10uF

iii) R = 1kΩ, C = 100uF

iv) R = 1kΩ, C = 1mF
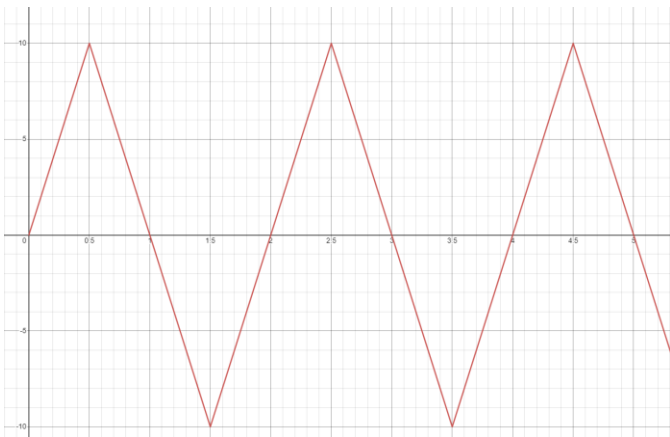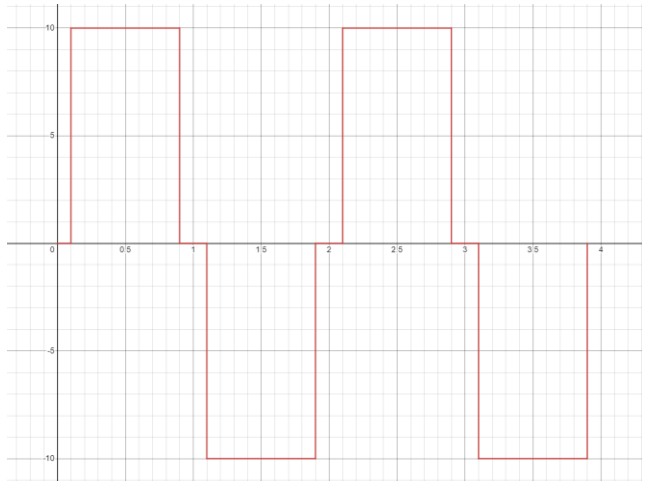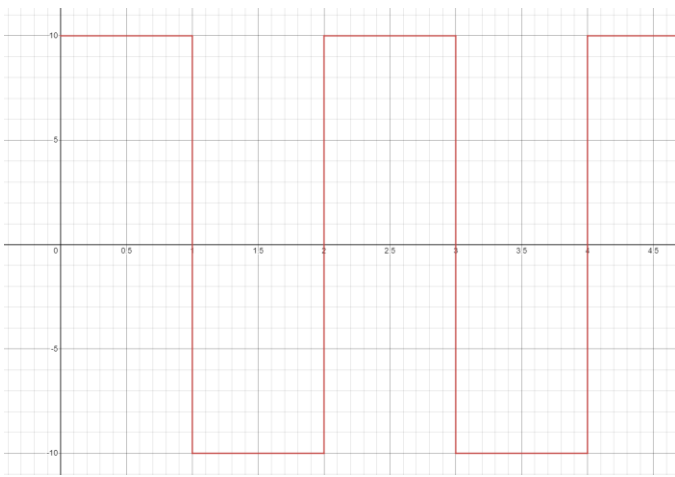
v) R = 1kΩ, C = 10mF

3) Find the output waveforms for the following input waveforms when passed through a: (CO1) [10+10]

a) Half wave rectifier b) Full wave recitifer. Assume the diodes are ideal with V_T = 0V.
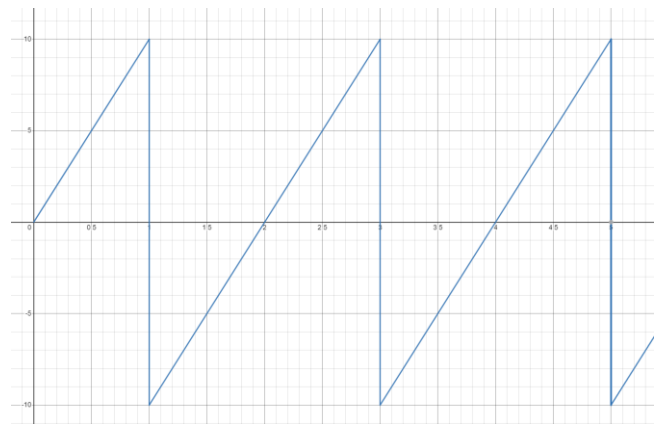
4. Now find the DC/Average value for each input waveforms when passed through: a) Half wave rectifier b) Full wave rectifier. (CO1) [20 + 20]

Hint: The average value can be computed by finding the area of the output waveform in one cycle divided by the time period for that entire cycle. The area is computed usually by an integration, however, there are much simpler ways of calculating area of graphs if the shapes are simple enough!