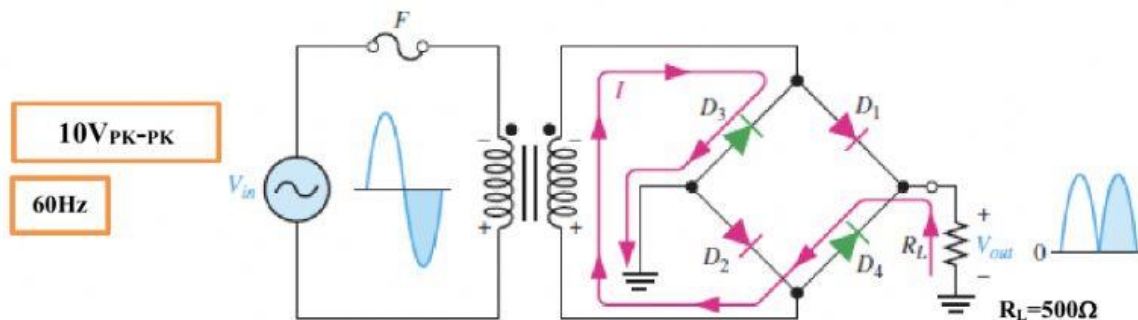


This Worksheet provides evidences for the GC 1.9 to 1.14.

GC	GC1.9	Discuss the circuit construction and principle of operation of half-wave rectifier circuits, and sketch the input and output waveforms.
GC	GC1.10	Calculate the peak output voltage and the average value of the half-wave rectified voltage waveform.
GC	GC1.11	Discuss the circuit construction and principle of operation of full-wave rectifier circuits (Center Tapped Full Wave Rectifier and Full Wave Bridge Rectifier), and sketch the input and output waveforms.
GC	GC1.12	Calculate the peak voltage and the average value of the full-wave rectified voltage waveform. Plot the waveforms across each half of the secondary winding and across the load resistor.
GC	GC1.13	Determine the peak output voltage for the bridge rectified voltage waveform.
GC	GC1.14	Demonstrate, with the aid of diagrams, the effect of adding a smoothing capacitor to the output of half-wave and full-wave rectifying circuits.

Q1) Study the circuit below and answer questions a,b,c,d,e, f, g and H.



- What is the name of the circuit?
- What is the Peak input voltage ?
- If the diode used is practical and $V_F=0.7V$, what is the value of the output DC voltage?
- Calculate the current in the load resistor $R_L=$
- What is the value of the average voltage across the resistor?
- What will be the voltage across the load resistor during the negative half cycle?
- During the positive half cycle the circuit the diodes and will be conducting, while D_3 and D_4 will be, but in the negative half cycle D_1 and D_2 will be reversed and and will be conducting.
- How does the output voltage across the resistor will look like after adding smoothing capacitor in parallel with the load? As shown below. Please tick the correct answer.

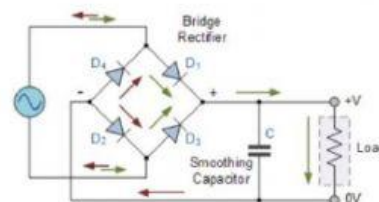
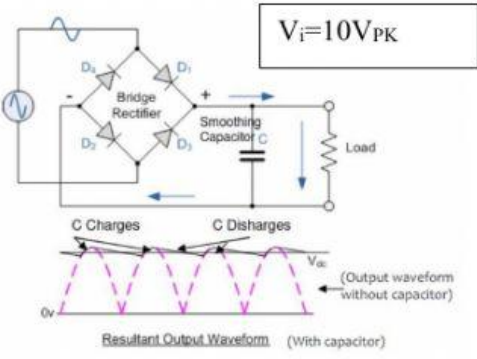
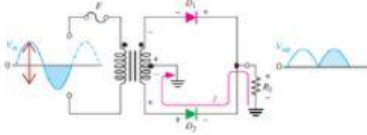
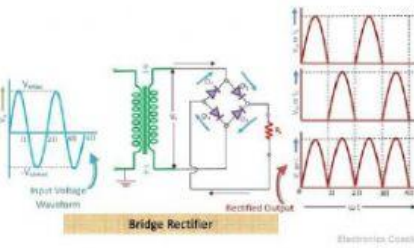
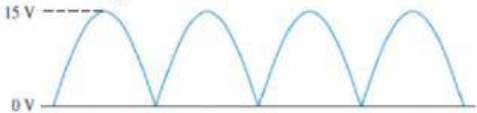
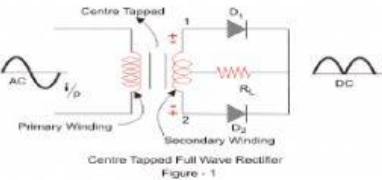


Figure 1with smoothing capacitor



Q2) Match the circuit with its description.

No.	Circuit	No.	Parameter
1	The peak output voltage of full wave bridge rectifier with 10V _{PK-PK} input.		Center tapped transformer full wave rectifier.
2			9.6V
3	What is the average voltage (V_{AVG}) of 10V output of full wave bridge?		$V_{out} = 5 - 1.4 = 3.6V_{PK}$
4	 <p>$V_i = 12V_{PK-PK}$ Turns ratio = 2:1</p>		Full wave bridge rectifier
5			$2(10 - 1.4) / 3.14 = 5.4V$
6			$V_{out} = 3 - 0.7 = 2.3V$ Average output voltage = $2.3 / 3.14 = 0.73V$
7	 <p>Centre Tapped Full Wave Rectifier Figure - 1</p>		Full wave rectifier with smoothing capacitor