

# Indian Institute of Information Technology, Allahabad

ELECTRONICS AND COMMUNICATION ENGINEERING DEPARTMENT

Course Name: Fundamental of Electrical and Electronics

## EXPERIMENT NO: 12

### Objective:

To study the input and output waveform of half wave rectifier and calculate ripple factor.

### Components and equipment required:

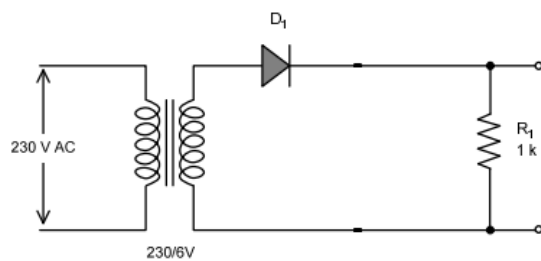
Diode, resistor, capacitor, Transformer, Voltmeter, Ammeter, Breadboard and CRO.

### Theory:

For half wave rectifier,  $V_{rms} = V_m/2$  and  $V_{dc} = V_m/\pi$ ; where,  $V_{rms}$  = rms value of input,  $V_{dc}$  = Average value of input and  $V_m$  = peak value of output.

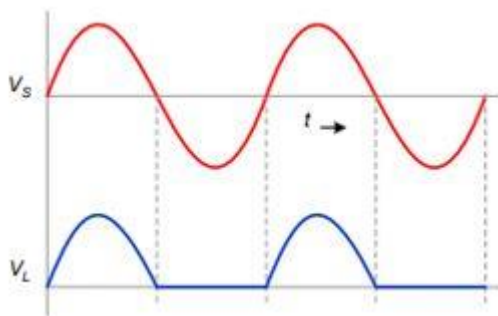
Ripple factor  $r = \frac{V_{r,rms}}{V_{dc}}$  where,  $V_{r,rms}$  is the rms value of the ac component. Since,  $V_{rms}^2 = V_{r,rms}^2 + V_{dc}^2$ , ripple factor  $r = \sqrt{\left(\frac{V_{rms}}{V_{dc}}\right)^2 - 1} = 1.21$ .

### Circuit Diagram:



Half wave rectifier without filter

### Waveforms:



**Calculation:**

S.no.	$V_m$	$V_{rms} = V_m/2$	$V_{dc} = V_m/\pi$	$\sqrt{\left(\frac{V_{rms}}{V_{dc}}\right)^2 - 1}$

**Results:**

Ripple factor of half wave rectifier without filter is = .....  
Frequency of the output waveform  $f_{out} = \dots\dots f_{in}$

**Precautions:**

1. While doing the experiment do not exceed the ratings of the diode. This may lead to damage the diode.
2. Do not switch ON the power supply unless you have checked the circuit connections as per the circuit diagram.