

## Reading Comprehension

### Passage 4

This sample text has been prepared for the Master of Electrical Engineering entrance exam by Alpha Consulting Group.

This section discusses some simple uncontrolled rectifier circuits that are commonly encountered. The term uncontrolled refers to the absence of any control signal necessary to operate the primary switching elements (diodes) in the rectifier circuit. The discussion of controlled rectifier circuits, and the controlled switches themselves, is more appropriate in the context of power electronic applications. Rectifiers are the fundamental building block in dc power supplies of all types and in dc power transmission used by some electric utilities. The forward drop across the diodes is ignored on the output, if the peak voltages of the input and output are large compared to one V. The circuit changes a sinusoidal waveform with no dc component (zero average value) to one with a dc component of two V peak.

The rms value of the output is 0.707 V peak. The dc value can be increased further by adding a low-pass filter in cascade with the output. The usual form of this filter is a shunt capacitor or an LC filter. The resonant frequency of the LC filter should be lower than the fundamental frequency of the rectifier output for effective performance. The ac portion of the output signal is reduced while the dc and rms values are increased by adding the filter. The remaining ac portion of the output is called the ripple. Though somewhat confusing, the transformer, diodes, and filter are often collectively called the rectifier circuit. Another circuit topology commonly encountered is the bridge rectifier, which can be either single or three-phase versions of the circuit. In the single-phase circuit two diodes conduct on the positive half-cycle of the input while the other two conduct on the negative half-cycle of the input. Alternate pairs of diodes conduct in the three-phase circuit depending on the relative amplitude of the source signals.

## Questions

1. The basic building block of dc power supplies are:

- 1) Diodes.
- 2) Semiconductors.
- 3) Conductors.
- 4) Rectifiers.

2. According to the author the rms voltage of 0.707V peak is because:

- 1) The peak input/output voltages are large.
- 2) The peak input/output voltages are small.
- 3) The peak input/output voltages are small compared to one volt.
- 4) The peak input/output voltages are large compared to one volt.

**3. According to the text one can increase the dc value by adding a low pass filter in:**

- 1) Serial with the output.**
- 2) Serial with the input.**
- 3) Parallel with the output.**
- 4) Parallel with the input.**

**4. The word "ripple" as used in the text means:**

- 1) Slight variation.**
- 2) Toothed.**
- 3) Wavy.**
- 4) Agitate.**

**5. A bridge rectifier can be made to be:**

- 1) Single phase only.**
- 2) Three phase only.**
- 3) Both 1 and 2**
- 4) Single or three phases.**

**6. According to the text depending on the peak of source signal in a three phase bridge:**

- 1) One pair changes to the other pair.**
- 2) One pair changes to the negative half cycle.**
- 3) One pair changes to the positive half cycle.**
- 4) Both pairs conduct.**

## Answers

1 ==> 4

2 ==> 4

3 ==> 1

4 ==> 3

5 ==> 4

6 ==> 4