

Easy

Deputy Executive Engineer (Electrician) 2026

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RMS value of the voltage is 100 V

- A

1, 2, 3, 4
- B

2, 4
- C

1, 2, 3

Correct
- D

Correct Answer: C

Full Detailed Explanation

Given: $V_{rms} = 100\text{ V}$

Options: 1, 2, 3, 4

Correct Answer: C (1, 2, 3)

Explanation:

The RMS value of a periodic waveform is defined as the value of a DC voltage which produces the same average power in a resistive load as the AC voltage.

For a sinusoidal waveform, the relationship between the peak value (V_m) and the RMS value (V_{rms}) is given by:

$$V_{rms} = \frac{V_m}{\sqrt{2}}$$

Substituting the given RMS value:

$$100 = \frac{V_m}{\sqrt{2}}$$
$$V_m = 100 \times \sqrt{2} = 141.4\text{ V}$$

The average value (V_{dc}) of a sinusoidal waveform is given by:

$$V_{dc} = \frac{V_m}{\pi} = \frac{141.4}{\pi} = 45.0\text{ V}$$

The average value of the waveform is 45.0 V.

Options 1, 2, and 3 are correct.