

Medium

Deputy Executive Engineer (Electrician) 2026

Gujarat Public Service Commission / Assistant Engineer (Electrical)

With reference to Fourier Series representation of periodic signals, consider the following statements: 1. Fourier Series decomposes a periodic signal

A

1 and 2 only

B

2 and 3 only

C**1, 2 and 4 only****Correct****D**

All of the above

Correct Answer: C

Full Detailed Explanation

Correct Answer: C - 1, 2 and 4 only
Quick Concept Explanation Fourier methods decompose signals into frequency components. Fourier series represents periodic signals as harmonically related sinusoids or equivalent complex exponentials; non-periodic signals are handled by Fourier transform rather than ordinary Fourier series. Key relation: Real even $x(t) \rightarrow X(\omega)$ real and even. Exam focus: Symmetry can eliminate sine/imaginary terms immediately. Common trap: Fourier series is fundamentally for periodic signals. Statement-wise Verification Statement 1 - Correct. Fourier Series decomposes a periodic signal into a sum of harmonically related sinusoids. Fourier series represents periodic signals as harmonically related sinusoids or equivalent complex exponentials Statement 2 - Correct. The coefficients of the Fourier Series depend on the fundamental period of the signal. A real even time-domain signal has a real even Fourier transform and zero odd component. Statement 3 - Incorrect. Fourier Series can directly represent non-periodic signals without modification. Ordinary Fourier series is for periodic signals; Fourier transform is used for non-periodic signals Statement 4 - Correct. Both exponential and trigonometric forms of Fourier Series are equivalent representations. Fourier series represents periodic signals as harmonically related sinusoids or equivalent complex