Medium | Deputy Executive Engineer (Electric | 2026 | orts Authority of Gujarat / Assistant Engineer (El

Consider the following statements regarding Frequency Response: 1. Frequency response describes system behavior as function of frequency. 2. Bode plot represents

A 1 and 3 only

B 1 and 4 only

C 2 and 3 only

D **1, 2 and 3 only** Correct

Correct Answer: D

Full Detailed Explanation

Correct Answer: D - 1, 2 and 3 only Quick Concept Explanation Frequency response describes how a linear system's gain and phase vary with sinusoidal frequency. Gain margin and phase margin quantify distance from the critical feedback condition and are widely used as relative-stability measures; pole and zero locations shape the frequency response. Key relation: At gain crossover _gc: PM=180 + G(j _gc).Exam focus: Positive phase margin usually indicates a stable negative-feedback loop with normal assumptions. Common trap: Frequency response is not independent of poles and zeros. Statement-wise Verification Statement 1 - Correct.Frequency response describes system behavior as function of frequency.Frequency response describes how a linear system's gain and phase vary with sinusoidal frequency. Statement 2 - Correct.Bode plot represents magnitude and phase variation with frequency.Frequency response describes how a linear system's gain and phase vary with sinusoidal frequency. Statement 3 - Correct.Gain margin and phase margin indicate system stability.Gain margin and phase margin quantify distance from the critical feedback condition and are widely used as relative-stability measures Statement 4 - Incorrect.Frequency response is independent of system poles.Poles and zeros directly shape magnitude and phase response.Core Concept Frequency response describes how a