


Take Test: Test 3 (2018-19)


Test Information

Description

Instructions

Timed Test	This test has a time limit of 1 hour. This test will save and be submitted automatically when the time expires. Warnings appear when half the time, 5 minutes, 1 minute, and 30 seconds remain.
Multiple Attempts	This Test allows 3 attempts. This is attempt number 1.
Force Completion	This Test can be saved and resumed at any point until time has expired. The timer will continue to run if you leave the test. This test does not allow backtracking. Changes to the answer after submission are prohibited.

 Moving to the next question prevents changes to this answer.

Question 5 of 12 

Question 5

9 points

Save Answer


Consider a beamformer which employs a uniform array of N antennas and operates in the presence of a single signal with direction $(\theta = 30^\circ, \phi = 0^\circ)$. The carrier frequency is 2.4 GHz and the manifold vector for the Direction-of-Arrival $(\theta = 30^\circ, \phi = 0^\circ)$ is

$$[-0.1125 + 0.9936i, 0.6661 + 0.7458i, 1.0000, 0.6661 - 0.7458i, -0.1125 - 0.9936i]^T$$

Consider that the array steers its main lobe towards the direction $(\theta = 30^\circ, \phi = 0^\circ)$, the power of the received signal is 1 and the channel noise is additive white Gaussian noise of power 0.01. If at the output of the beamformer P_{out} is the power of the desired signal and SNR_{out} denotes the signal-to-noise ratio, which of the following statements is correct?

- (a) $P_{out}=5$ and $\text{SNR}_{out}=100$.
- (b) $P_{out}=25$ and $\text{SNR}_{out}=100$.
- (c) $P_{out}=5$ and $\text{SNR}_{out}=500$.
- (d) $P_{out}=25$ and $\text{SNR}_{out}=500$.
- (e) None of the above.

- ☐ a
- ☐ b
- ☐ c
- ☐ d
- ☐ e

 Moving to the next question prevents changes to this answer.

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