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 **10** of **12**

Question 10

8 points Save Answer

Consider a linear array of 5 antennas with locations

$$[-2, \quad -1, \quad 0, \quad 1, \quad 2]$$

operating in the presence of 3 sources transmitting the signals $m_1(t)$, $m_2(t)$ and $m_3(t)$. The directions-of-arrival of the three signals are correctly estimated to be equal to (30°,0°), (35°,0°) and (90°,0°) and the noise power is 0.1. If the covariance matrix of the received signal $\underline{x}(t)$ is

10.2040 - 0.0000i -0.5788 + 4.1396i 6.7444 - 4.5482i 4.5234 + 6.4366i 1.2585 - 4.0588i
-0.5788 - 4.1396i 7.2210 + 0.0000i -1.7454 + 0.1726i 5.9678 - 4.3653i 1.4498 + 3.4004i
6.7444 + 4.5482i -1.7454 - 0.1726i 8.0986 + 0.0000i -0.6623 + 4.4220i 4.8585 - 3.4939i
4.5234 - 6.4366i 5.9678 + 4.3653i -0.6623 - 4.4220i 9.5774 + 0.0000i -1.5253 + 1.1245i
1.2585 + 4.0588i 1.4498 - 3.4004i 4.8585 + 3.4939i -1.5253 - 1.1245i 6.5210 + 0.0000i

(please copy the above matrix to MATLAB)

which of the following results is correct?

(a) $\mathcal{E}\{m_1(t).m_2^*(t)\} = 0.2457 - 0.1721i,$

(b) $\mathcal{E}\{m_1(t).m_2^*(t)\} = 0.3536$

(c) $\mathcal{E}\{m_1(t).m_3^*(t)\} = -0.4500$

(d) $\mathcal{E}\{m_1^2(t)\} = 2.1$

(e) $\mathcal{E}\left\{m_3^2(t)\right\} = 3.2$

- a
- b
- c
- d
- e

⚠ Moving to the next question prevents changes to this answer.

Question **10** of **12**