

Unit 6 - Week 4

Course outline

How does an NPTEL online course work?

Practice Assignment

Week 1

Week 2

Week 3

Week 4

Lecture 15 : Linear Arrays-I

Lecture 16 : Linear Arrays-II

Lecture 17 : Linear Arrays-III

Lecture 18 : Planar Arrays

Study Material: Antenna Arrays -I

Study Material: Antenna Arrays -II

Study Material: Antenna Arrays -III

Study Material: Array Applications

Quiz : Assignment-4

Assignment-4 Solution

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Weekly Feedback

Week 5

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Week 8

Week 9

Week 10

Week 11

Week 12

Text Transcripts

Assignment-4

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-02-26, 23:59 IST.

1) What is the consecutive phase difference between the 10 elements of a linear array with spacing $d=0.7\lambda_0$ for scanning the beam at an angle of 20° from the broadside. **2 points**

- 86°
 90°
 180°
 270°

No, the answer is incorrect.

Score: 0

Accepted Answers:
 86°

2) An antenna array is required to scan up to an angle $\theta = 60^\circ$ measured from the broadside. To avoid grating lobes, the maximum allowed separation between the elements is: **2 points**

- 0.70λ
 0.66λ
 0.54λ
 0.89λ

No, the answer is incorrect.

Score: 0

Accepted Answers:
 0.54λ

Common data for Questions 3 to 7: For a 10 element array of isotropic antennas with equal spacing of 0.6λ and fed with equal amplitude and phase,

3) Approximate gain of the array in dBi is: (assume efficiency is 90%) **2 points**

- 6.3
 9.8
 14.2
 20.6

No, the answer is incorrect.

Score: 0

Accepted Answers:
9.8

4) Approximate HPBW of the array is: **2 points**

- 3.8°
 6.2°
 9.4°
 15.6°

No, the answer is incorrect.

Score: 0

Accepted Answers:
 9.4°

5) Approximate direction of first null from broadside is: **2 points**

- 12°
 10°
 30°
 45°

No, the answer is incorrect.

Score: 0

Accepted Answers:
 10°

6) The direction of first side lobe level from broadside is: **2 points**

- 75.5°
 62.5°
 37.5°
 14.5°

No, the answer is incorrect.

Score: 0

Accepted Answers:
 14.5°

7) Approximate magnitude of first side lobe level in dB is: **2 points**

- 13.2
 -16.5
 -18.2
 -19.6

No, the answer is incorrect.

Score: 0

Accepted Answers:
-13.2

8) A rectangular planar antenna array of isotropic elements has 16 elements in x direction with inter-element spacing of $0.6\lambda_0$ and 8 elements in y direction with inter-element spacing of $0.7\lambda_0$, respectively. All the elements are fed with equal amplitude and phase. Approximate gain of the array in dBi is: (assume efficiency is 100%) **2 points**

- 15.4
 18.5
 20.8
 27.4

No, the answer is incorrect.

Score: 0

Accepted Answers:
27.4

Common data for Questions 9 and 10: A planar rectangular array of isotropic elements with spacing of 0.55λ and orthogonal HPBW's of 8° and 5° , respectively in the broadside direction is designed.

9) The number of elements in the array is: **2 points**

- 13 x 19
 10 x 16
 20 x 20
 14 x 23

No, the answer is incorrect.

Score: 0

Accepted Answers:
13 x 19

10) The maximum gain of the antenna in dBi will be: (assume efficiency is 100%) **2 points**

- 20
 29
 25
 32

No, the answer is incorrect.

Score: 0

Accepted Answers:
29