2023-EC684-oncampus_EC684-2023-Btech_M.Tech_Proctored_Test_2023/09/20 18:00 [#2181]

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Test Start Time	9/20/2023, 6:00:31 PM
Marks Scored	22.0 / 60.0
Total Questions	14
Attempted Questions	11
Correct Questions	10
Incorrect Questions	1
Skipped Questions	3
Pending Evaluation	0

List of Sections

Section - 1 Marks per question : 2.0 **Marks Scored : 18.0**

Q No.	Q. Type	Status	Marks	
1	Multiple Choice - Single Answer	✖	0.0	Hide Answer

Calculate the 3 dB beamwidth (in degree) in the x-y plane of an antenna the power pattern of which is given by

$$U(\theta,\phi)=\begin{cases}\sin^2\theta\sin\phi & 0\le\theta\le\pi;\ \ 0\le\phi\le\pi\\ 0 & 0\le\theta\le\pi;\ \pi\le\phi\le 2\pi\end{cases}$$

- 30
- 120
- 150
- 90

2	Multiple Choice - Single Answer	✔	2.0	Hide Answer

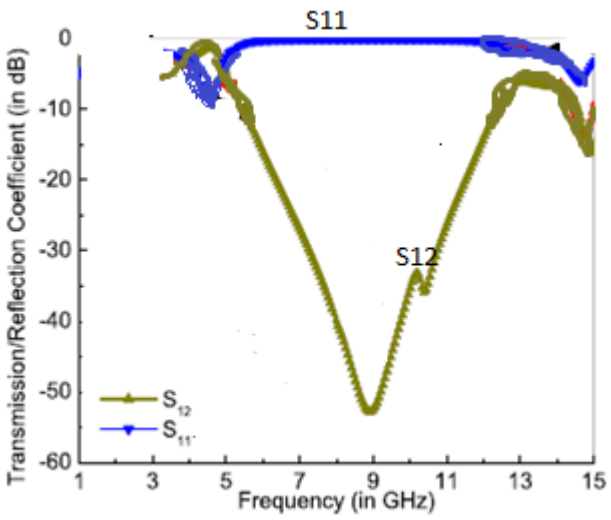
An antenna located in a city is a source of radio waves. How much time does it take the wave to reach a town 12,000 km away from the city?

- 36 s

- 20 ms
- 40 ms
- 20 µs

3 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

Look at the characteristic given below and identify the behavior of frequency selective surface over frequency range 6 to 12 GHz.



- Band stop
- Low pass
- High Pass
- Band pass

4 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

The loss resistance and radiation resistance of an antenna is 1 Ohm and 99 Ohm respectively. Calculate the power radiated by the antenna if the input power is 1 W.

- 0.99 mW
- 0099 W
- 0.099 mW
- 0.99 W

5 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

A quarter-wave monopole antenna operating in air at frequency 1 MHz must have an overall length of

- l > one wavelength
- 75 m
- 150 m
- 300 m

6 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

A receiving antenna is located 100 m away from the transmitting antenna. If the effective area of the receiving antenna is 500 cm^2 and the power density at the receiving location is 2 mW/m^2, the total power received is:

- l0 nW
- 10 µW
- 100 µW
- 100 nW

7 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

A receiving antenna in an airport has a maximum dimension of 3 m and operates at 100 MHz. An aircraft approaching the airport is 1/2 km from the antenna. The aircraft is in the far field region of the antenna.

- True
- both
- None
- False

8 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

At a distance of 8 km from a differential antenna, the field strength is 12 µV/m. The field strength at a location 20 km from the antenna is

- 75 µV/m
- 4.8 µV/m
- 1.92 µV/m
- 30 µV/m

9 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

Calculate impedance bandwidth (in %) of the antenna which provides $S_{11} \leq -10$ dB, SWR<2 over the frequency range 3 GHz to 7 GHz.

- 80
- 40
- 30
- 50

10 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

The main lobe level of a uniform array is at 0 dB. The first side lobe level of the array is at

- 13.46 dB
- -3 dB
- 3 dB
- -13.46 dB (selected)

Section - 2

Marks per question : 10.0 | **Marks Scored : 4.0**

Q No.	Q. Type	Status	Marks	
1	File Upload	✔	4.0	Hide Answer

(a) Write an expression of the ratio of excitation current for a 5-element array antenna with no side lobes.
(b) Draw the current distribution of a full wavelength long dipole antenna.
(c) Calculate the directivity of an antenna the power pattern is as follows:

$$U(\theta,\phi) = \begin{cases} \sin\theta\sin\phi & 0 \le \theta \le \pi;\ \ 0 \le \phi \le \pi \\ 0 & 0 \le \theta \le \pi;\ \pi \le \phi \le 2\pi \end{cases}$$

(3+2+5)

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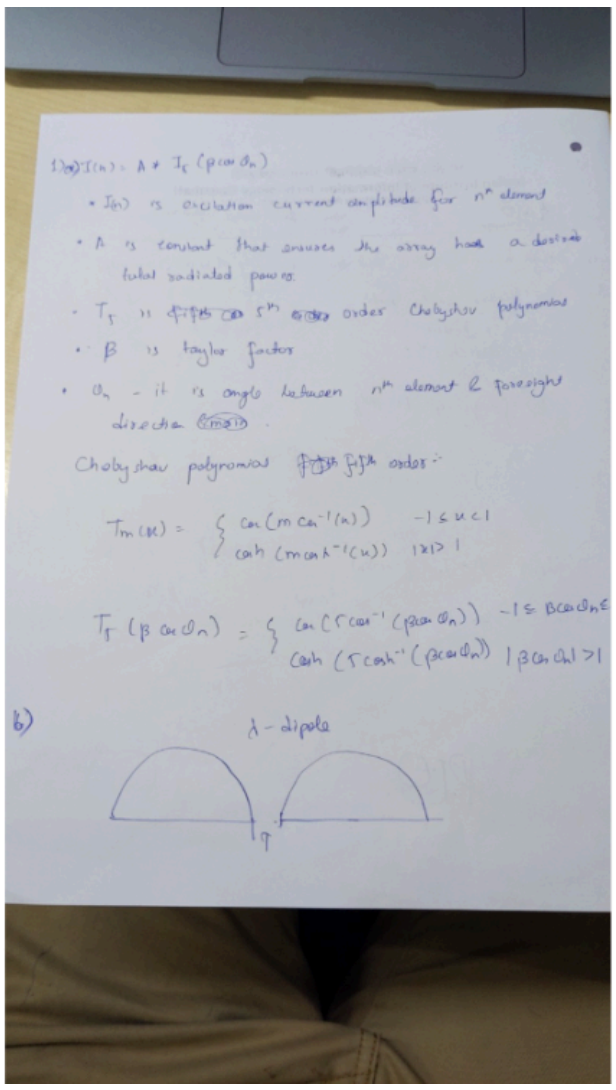
Original Response

Previous | Page: 1 / 2 | Next

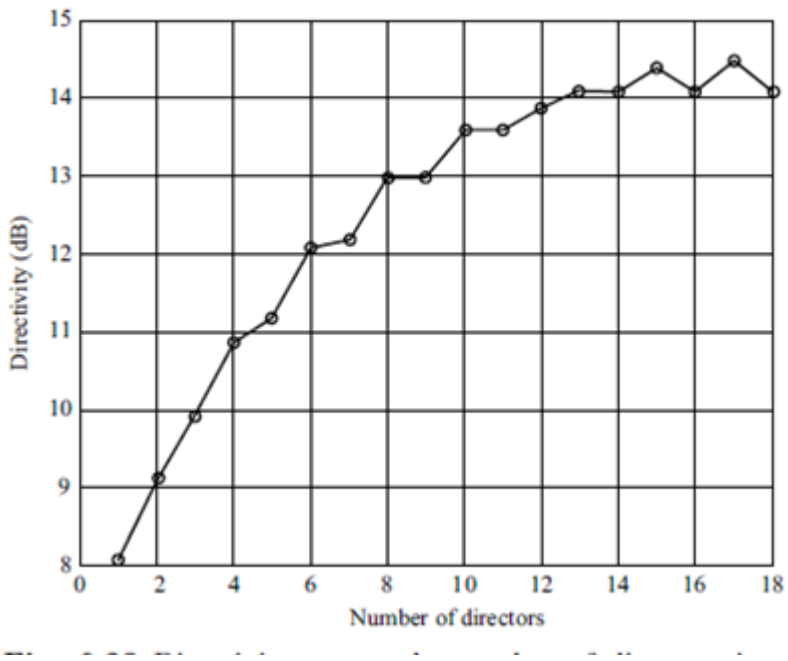
32 %



Previous Page: 1 / 2 Next

2 File Upload 0.0 Hide Answer

Design a Yagi Uda array that has a directivity of 12 dB at 145 MHz.



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Evaluator Comments

Not Answered

3 File Upload 0.0 Hide Answer

Consider a uniform broadside array with inter-element spacing (d) = λ/3. Draw the unit circle representation. Find out the number of lobes and their direction in visible region.

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Evaluator Comments

Not Answered

4 File Upload ⚠ 0.0 Hide Answer

An antenna with a gain, 4.11 dB, is transmitting 10 W power at 5 GHz and another antenna with a gain 3 dB higher than transmit antenna is used to receive the electromagnetic signal. Calculate the received power with the two antennas separated by a distance of 12 m.

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Evaluator Comments

Not Answered