

Antenna Basics Multiple Choice Test

Student's name: _____

Total points: _____

1. The propagation speed of an EM wave depends on the...
☐ Medium ☐ Frequency ☐ Polarization ☐ Power
2. Which of the following waves has the lowest propagation speed?
☐ EM wave ☐ Acoustic wave ☐ TEM wave ☐ TE₁₀ wave
3. Which devices do we not use at microwave frequencies to transmit signals?
☐ Waveguide ☐ 2-wire lines ☐ Optical fibers ☐ Transmission lines
4. When does the microwave region in the electromagnetic spectrum start?
☐ 1 Hz ☐ 1 kHz ☐ 1 MHz ☐ 1 GHz
5. Which absolute value does -3 dB correspond to in terms of power?
☐ 1 ☐ 0.5 ☐ 0.1 ☐ 10^{-3}
6. Does an antenna work at $f = 0$ Hz?
☐ Yes ☐ No ☐ Only in space ☐ Depends on antenna
7. The simplest ideal antenna is called...
☐ Horn ☐ Yagi-Uda ☐ Array ☐ Hertzian dipole
8. Which one is not a typical antenna parameter?
☐ Gain ☐ Conductivity ☐ Directivity ☐ Radiation Pattern
9. Which theorem should passive antennas satisfy?
☐ Radiation ☐ Gauss' theorem ☐ Reciprocity ☐ Efficiency
10. What is the gain of an isotropic radiator?
☐ -1 dB ☐ 0 dB ☐ 5 dB ☐ 10 dB

Please continue on backside.

11. Which polarization of a wave does a dipole antenna transmit?

- ☐ Left hand circular ☐ Right hand circular ☐ Linear ☐ Elliptical

12. Which one is not a loss mechanism in an antenna?

- ☐ Matching loss ☐ Resistive loss ☐ Radiation loss ☐ Discharge loss

13. Which expression states qualitatively the behavior in the middle of a $\lambda/2$ -dipole antenna?

- ☐ $V=\max, I=\max$ ☐ $V=\max, I=\min$ ☐ $V=\min, I=\max$ ☐ $V=\min, I=\min$

14. Which element should exist in order to have a $\lambda/4$ -monopole antenna?

- ☐ Anechoic chamber ☐ Semiconductor ☐ Insulator ☐ Ground plane

15. Which element is needed for a Yagi antenna?

- ☐ Dictator ☐ Director ☐ Collector ☐ Modulator

16. What is a typical advantage of arrays?

- ☐ Lower gain ☐ More Radiation ☐ Smaller size ☐ Better directivity

17. Which antenna parameter does not determine the start of the far field region?

- ☐ Size ☐ Frequency ☐ Medium ☐ Input impedance

18. Which expression does not stand for an antenna type?

- ☐ Parabolic reflector ☐ Microstrip ☐ Fraunhofer ☐ Horn

19. Which of the following antennas has typically the highest gain?

- ☐ Horn antenna ☐ Hertzian dipole ☐ Handy antenna ☐ Isotropic radiator

20. The abbreviation “dBm” means in antenna technology usually...

- ☐ “dB Meter” ☐ “dB measured” ☐ “dB Milliwatt” ☐ “dB modulated”