

UNIT -V

1. Thermal noise is generated due to:
 - a) Quantum effects in semiconductors b) Random motion of electrons in resistors c) Magnetic field variations d) External interference only Answer: b
2. The power spectral density of thermal noise is:
 - a) Constant across frequency (white noise) b) Increasing with frequency c) Decreasing with frequency d) Zero at high frequencies Answer: a
3. The effective noise temperature is defined as:
 - a) Ratio of noise power to bandwidth b) Equivalent temperature that produces the same noise power c) Actual resistor temperature d) Average system temperature Answer: b
4. The noise equivalent bandwidth of a system is:
 - a) Bandwidth where noise power equals signal power b) Bandwidth of an ideal rectangular filter with same noise power as actual filter c) Bandwidth of the input signal d) Bandwidth of Gaussian noise Answer: b
5. The noise figure of an amplifier is:
 - a) Ratio of input SNR to output SNR b) Ratio of output SNR to input SNR c) Ratio of noise power to signal power d) Ratio of gain to bandwidth Answer: a
6. The average noise figure of cascaded networks is calculated using:
 - a) Friis formula b) Fourier transform c) Laplace transform d) Nyquist theorem Answer: a
7. Narrowband noise can be represented as:
 - a) Sum of in-phase and quadrature components b) Single sinusoidal component c) Gaussian distribution only d) Purely deterministic signal Answer: a
8. In quadrature representation, narrowband noise is expressed as:
 - a) Real and imaginary parts of a complex envelope b) Magnitude and phase only c) Autocorrelation and cross-correlation d) Power and bandwidth Answer: a
9. The noise figure of a system is always:
 - a) Greater than or equal to 1 b) Less than 1 c) Equal to 0 d) Negative Answer: a
10. Arbitrary noise sources are modeled using:
 - a) Equivalent noise temperature and bandwidth b) Only Gaussian distribution c) Only deterministic functions d) Laplace transforms Answer: a

Fill in the Blanks (FIBs)

1. _____ noise is caused by random motion of electrons in resistors. **Answer:** Thermal noise
2. The **power spectral density** of thermal noise is constant, hence it is called _____ noise. **Answer:** White noise
3. The _____ temperature is the equivalent temperature that produces the same noise power. **Answer:** Effective noise temperature
4. The _____ bandwidth is the bandwidth of an ideal filter with same noise power as actual filter. **Answer:** Noise equivalent bandwidth
5. The _____ of an amplifier is the ratio of input SNR to output SNR. **Answer:** Noise figure
6. The _____ formula is used to calculate noise figure of cascaded networks. **Answer:** Friis
7. _____ noise can be represented using in-phase and quadrature components. **Answer:** Narrowband
8. In quadrature representation, narrowband noise is expressed as real and imaginary parts of a _____. **Answer:** Complex envelope
9. The _____ of a system is always ≥ 1 , representing degradation of SNR. **Answer:** Noise figure
10. _____ noise sources are modeled using equivalent noise temperature and bandwidth. **Answer:** Arbitrary