Multiple-Choice Questions on Drug Stability

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1. The study of the rate of drug decomposition and the factors that influence it is known as:
a) Biopharmaceutics
b) Pharmacokinetics
c) Physical pharmacy
d) Pharmaceutical kinetics

2. The rate of drug degradation is most commonly expressed in terms of:
a) Half-life (t1/2)
b) Rate constant (k)
c) Shelf life (t90)
d) Order of reaction
3. The shelf life of a drug is defined as the time required for the concentration of the drug to decrease to what percentage of its initial concentration?
a) 100%
b) 95%
c) 90%
d) 50%

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2. Kinetics of Drug Degradation

4. A drug degradation reaction that proceeds at a constant rate, independent of the concentration of the reactant, is a:
a) First-order reaction
b) Second-order reaction
c) Zero-order reaction
d) Pseudo-first-order reaction
5. The half-life of a first-order reaction is:
a) Directly proportional to the initial concentration.
b) Inversely proportional to the initial concentration.
c) Independent of the initial concentration.
d) Proportional to the square of the initial concentration.
6. For a zero-order reaction, the relationship between the drug concentration (C) and time (t) is best described by which equation?
a) $\ln(C) = -kt + \ln(C0)$
b) $C = C0 - kt$

c) 1/C=kt+1/C0
d) t1/2=0.693/k

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3. Factors and Mechanisms

7. Which of the following is an example of chemical degradation of a drug?
a) Crystallization
b) Oxidation
c) Polymorphic transformation
d) Phase separation
8. The hydrolysis of a drug is the cleavage of a chemical bond by reaction with:
a) Oxygen
b) Heat
c) Water
d) Light
9. The Arrhenius equation, k=Ae−Ea/RT, describes the relationship between the rate constant (k) and which of the following?
a) pH
b) Humidity
c) Temperature
d) Light intensity
10. What is a key role of an antioxidant in a pharmaceutical formulation?
a) To prevent hydrolysis
b) To prevent oxidation
c) To prevent photolysis
d) To prevent polymerization
