I. Choose one of the best answer. (5% each)

1. The difference between peak and trough concentrations is greatest when a drug is given at dosing intervals
   A. about equal to half-life
   B. much longer than half-life
   C. much shorter than half-life
   D. equal to the time it takes to reach peak concentration following a single oral dose
   E. equal to half-life times serum creatinine

2. If an oral capsule formulation of drug A produces a serum concentration time-curve having the same area under the curve as that produced by an equivalent dose of drug A given IV, it can generally be concluded that
   A. the IV route is preferred to the oral route
   B. the capsule formulation is essentially completely absorbed
   C. the drug is very rapidly absorbed
   D. all oral dosage forms of drug A will be bioequivalent
   E. there is no advantage to the IV route

II. Describe the factors that affect oral drug bioavailability. (10%)

III. Based on the pH partition theory, estimate the degree of ionization of a weak acid drug (pKa = 3) in the stomach in the fasted state. (10%)

IV. Describe the important issues/points that should be considered in the evaluation of modified-release products. (10%).

V. In bioequivalence studies, what parameters are generally used to demonstrate the bioequivalence of two drug products? And why? (10%)

VI. Define and describe the two primary pharmacokinetic parameters. (10%)
(1) Clearance
(2) Volume of distribution

VII. Explain the differences between transdermal and topical drug delivery. (10%)

VIII. What are the approaches available to evaluate the bioavailability/bioequivalence of topical dermatologic products? (15%)

IX. Describe the characteristics of protein/peptide drugs that require special consideration in designing their drug delivery systems. What strategies can be used to deliver protein/peptide drugs? (15%)