Question #1:
Explain why high peak concentrations of aminoglycosides do not lead to increased nephro- or ototoxicity, whereas high trough concentrations over a longer period of time show extended toxicity. (2pts)

Question #2:
A patient was given 100 mg gentamicin over 30 minutes (i.v.) from 8:30 to 9:00 am. The following two serum levels were measured: 6μg/ml at 9:30 am and 2μg/ml at 4:00 pm. Calculate:

a. the elimination rate constant ke and half-life (1pt)

b. the peak concentration at 9:00 am (0.5pt)

c. the trough concentration at 4:30 pm (0.5pt)

d. the volume of distribution (1pt)
**Question #3:**

H.W., a 51-year-old, 5’8”, 72 kg woman with a serum creatinine of 1.5mg/dL, has been started on 1.5g of vancomycin over one hour short-term infusion every 12h for the treatment MRSA skin infection.

a. Calculate the initial peak and trough vancomycin concentrations. (2 pts)

b. Predict the steady state peak and trough concentrations using the information from above and discuss the results. (2pts)

**Question #4:**

Which combination of the following pharmacokinetic changes best describes the elderly and neonates? (These groups share similar PK characteristics.) (1pt)

1). Low renal clearance
2). Longer half-lives
3). Low metabolic clearance
4). Decreased protein binding
5). Relatively less body water

A) 1 & 4
B) 1, 2, 3& 4
C) 1, 3, 4 &5
D) 1, 4, &5
E) all of the above