Question 1: (2 points)
A pharmaceutical company has developed a new aminoglycoside. The company got the following data from two patients from a small pilot study. Both patients have normal renal function (CL_{Cr}=0.13 \text{ L/min}). Assume all male patients.
Patient I weighs 60 kg and Patient II weighs 90 kg. Both patients are 6’ tall. Calculate the half-life for both patients.

Question 2: (2 points)
Discuss, why the sampling time is important to monitor aminoglycoside administration. Please include why it is important for the nurse to record the exact sampling time, and when peak and trough levels should be drawn.

Question 3: (2 points)
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.

Question 4:
A 4 y.o. infant is administered to the Shands emergency room and is diagnosed with possible pneumonia. The infant weighs 13.5 kg and is 3.6 ft tall. He was started on a gentamicin therapy with 5mg q8h. On day three plasma samples were drawn for therapeutic drug monitoring. Assume infusion lasting 0.5 hr.
The gentamicin dosing schedule is 8-16-24h. 
The following plasma concentrations were obtained.
Gentamicin peak serum concentration drawn @ 9 am: 8 mg/L
Gentamicin trough serum concentration drawn @ 3:30 pm: 3mg/L
a) Determine the estimated k_e and half life in this patient. (1 point)

b) Calculate the patients Volume of Distribution. (1 point)

c) Compare the measured peak and trough levels with the recommended therapeutic concentrations. (1 point)

d) Calculate the dose and dosing regimen to achieve peak concentration of max. 5 mg/L and trough concentration of 1 mg/L. (1 point)