1. Use the following **steady-state** data collected from a patient to answer this question.

- 100 kg male subject
- GFR = 200 L/day
- 24 hour urine collection = 2.0 liters
- Urine creatinine concentration = 200 mg%

Base on these data, his:

a) plasma creatinine concentration is 1 mg%

b) creatinine production rate is 1000 mg/24 hours

c) plasma creatinine concentration is 2 mg%

d) creatinine production rate is 2000 mg/24 hours

e) plasma creatinine concentration is 3 mg%

2. Calculate the GFR from the following data.

- Urine flow rate = 1.5 ml/min
- Arterial plasma inulin concentration = 1.0 mg/ml
- Renal venous plasma inulin concentration = 0.8 mg/ml
- Renal plasma flow = 500 ml/min

\[
C = \frac{U \cdot V}{P_x}
\]

- a) 50 ml/min
- b) 100 ml/min
- c) 150 ml/min
- d) 200 ml/min
- e) cannot be calculated because the urine inulin concentration is unknown

3. An increase in the renal plasma flow in a glomerulus at filtration pressure equilibrium will

- a) increase the GFR
- b) decrease the GFR
- c) have little effect on the GFR

4. Which one of the following statements regarding the proximal tubular fluid to plasma concentration ratio TF/P of a solute that is freely filtered is correct? **C. inulin**

- a) If solute w is reabsorbed at the same rate as water, the TF/P ratio will be 1.0
- b) If solute x is reabsorbed in excess of water the TF/P ratio will be greater than 1.0
- c) If solute y is inulin the TF/P ratio will be 1.0
- d) If solute z is secreted the TF/P ratio will be less than 1.0

5. In a person with untreated Type I diabetes mellitus,

- a) glucosuria occurs because the renal transport capacity for glucose is reduced
- b) there is a defect in the Na-glucose co-transporter
- c) the clearance of glucose will approximate the renal plasma flow
- d) the kidney extracts glucose
- e) the clearance of glucose is zero

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GFR = \frac{U \cdot V}{P_x}
\]

\[
U = \frac{\text{amount}}{\text{time}} = \frac{\text{vol}}{\text{time}} = \frac{V}{\text{time}}
\]

\[
P_x = \frac{U \cdot V}{GFR}
\]

\[
C = \text{GFR}
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\[
UV = (P_x)(P) - (P_x)(P)
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\[
\frac{P_v}{P} = \frac{P - P_x}{P}
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\[
\frac{V}{GFR} = \frac{P_v - P}{P}
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\[
66.66 = 0.1
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\[
(66.66)(1.5)
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