1. Stimulation of the osmoreceptors in the hypothalamus would be expected to cause all of the following to increase except

A. ADH release from the pituitary
B. water reabsorption from the renal collecting duct
C. rate of urine formation
D. osmolality of urine
E. none of the above; that is, none are exceptions since all would be expected to increase

2. As fluid passes along a juxtamedullary nephron, where is its osmolality (total concentration of dissolved particles) lowest? (Note: assume a normal concentration of circulating ADH.)

A. Bowman's capsule (glomerular filtrate)
B. fluid leaving the proximal tubule and entering the loop of Henle
C. fluid leaving the descending thin limb and entering the ascending thin limb of the loop of Henle
D. fluid leaving the thick ascending segment of the loop of Henle and entering the distal tubule
E. fluid leaving the collecting ducts (urine)

3. Drinking vodka (a beverage with a high ethanol content, for those of you unfamiliar with this substance) would be expected to cause excretion of a

A. large volume of concentrated urine
B. small volume of concentrated urine
C. large volume of dilute urine
D. small volume of dilute urine
E. normal volume of urine of normal osmolality

4. Drinking which of the following would lead to the highest rate of ADH secretion and release?

A. two liters of distilled water
B. two liters of sea water (mainly hyperosmotic saline)
C. two liters of iso-osmotic (isotonic) saline
D. two liters of human blood plasma

E. none of the above, since drinking two liters of any liquid leads to inhibition of ADH release

ANSWER KEY TO RENAL WATER REGULATION PRACTICE QUESTIONS

1. C The increased ADH release would lead to increased water reabsorption from the later distal tubule and collecting ducts, so urine formation rate would decrease.

2. D

3. C Ethanol inhibits release of ADH from the posterior pituitary, so a large volume of dilute urine would be excreted.

4. B Drinking two liters of sea water would increase extracellular osmolality, thus stimulating hypothalamic osmoreceptors and leading to a greater increase of ADH release than drinking two liters of the other solutions indicated.