

Solutions

2.1

- $C = 8 \times 1.5/0.1 = 120 \text{ mL/min}$ ✓ ($\approx \text{GFR}$).

2.2

- About 65 %.

2.3

- $6.1 + \log(24/1.2) = 6.1 + 1.30 = 7.40$ ✓.

3.1

- Expected: $1.5 \times 9 + 8 = 21.5 \pm 2$ ✓.
- Measured 22 is inside – compensation appropriate.
- Metabolic acidosis with appropriate respiratory compensation (single disorder).

3.2

- Load = $15 \times 125 = 1875 \text{ } \mu\text{mol/min}$ ✓ (vs $T_m \sim 2000$ at saturation: borderline).
- Above T_m , transport saturates: excess glucose remains in the tubule.
- The unreabsorbed glucose holds water osmotically $\rightarrow$ polyuria; water loss drives thirst and (eventually) volume depletion.