

**Part I: Complete the following sentences:**

1. Waste metabolites are removed from the patient's blood in hemodialysis using a process called ...
2. To prevent cross-infection, blood line in hemodialysis is ...
3. Detection of wrong input dialysate concentrates in hemodialysis can be done using ...
4. Air bubble detection is usually implemented based on ... sensors.
5. ... blood line takes blood from the hemodialysis machine to the patient.
6. If acid and bicarbonate inputs in hemodialysis are reversed, conductivity monitor will ...
7. Water is removed from a hemodialysis patient using a process called ...
8. Blood leak detection is usually implemented based on ... sensors.

**Part II. Answer the following problem:**

9. Consider the estimation of ultrafiltration rate in hemodialysis using 2 flowmeters before and after the dialyzer to measure the dialysate flow rate. If the flowmeters have an accuracy of 0.01%, compute the estimation accuracy for the ultrafiltration rate. Assume the dialysate flow rate as 0.8 L/min and assume it is required to remove 0.5 Kg of water from the patient every hour during the treatment.