

Exam I
(100 points)

- (10 pts) 1. Why is the "rule of capture" called by this name, and what features distinguish this rule from the more popular reasonable use doctrine?
- (18 pts) 2. A manufacturer (M) can invest in a water conservation measure. If M installs this measure now for \$100,000 and spends another \$20,000 on a maintenance contractor who will bill M in one year's time, M will reduce its water use by 70 million gallons over the coming year. Its water supplier bills at the year's end and charges \$2 per 1000 gallons. The conservation device will be nonfunctional after one year's time. This is all the available information. Develop advice on the economic merit of this measure for M.
- (22 pts) 3. Businesses A and B have the following demands for retail (processed) water: $w_A = 1200 - 2p$ and $w_B = 600 - p$ where w 's represent thousands of gallons and p is \$/thousand gallons. The utility supplying both businesses has marginal processing costs of \$10 per thousand gallons, and it can deliver 960,000 gallons total (no more) to A and B combined. How should this water be divided? Is there a surplus of water? Provide a quantitative solution.
- (23 pts) 4. Legislators for a riparian doctrine watershed have decided to transition to a correlative rights system for their surface water. Now they must decide on how to distribute the limited water right shares across the many parties wanting them. Auctioning or pricing these new permits is not politically acceptable, so they will be given away. Many of these parties have a long, documented history of water use and have made substantial investments. Other parties are growing and say they need more water. What recommendations on the initial distribution does economics have and why? What about giving everyone who signs up an equal share? Is a lottery a viable option?
- (27 pts) 5. Tubig City's Zoning Board is considering a one-year growth moratorium to halt all growth, by denying all building permit applications. Regardless of whether it enacts this change, the Board will revisit the matter in one-year's time and decide then about whether to commence or extend the policy for yet another year. There are several reasons for considering this policy. One of them is continued mining of the city's ground water source. The Board Chair has come to your office for a clear explanation about the impact of this policy on optimal water pricing, meaning optimal pricing for this year and the next. Use your 3-axis 2-period graphical model. A one-year moratorium will lower water demand both periods, because growth in period 2 merely adds to the growth of period 1. Explain to the Chair each piece of your graph, including what it entails and, if appropriate, how it is actually computed. Explain what changes in your graph with a moratorium. Explain how optimal prices will be affected.