Instructions: This is a closed-book, closed-notes exam. No calculators or electronic devices are allowed. Please turn off and put away all phones and other electronic devices. There are 8 multiple-choice questions and two free-response questions. Answer as many as you can in the time allowed. I do not expect everyone to be able to answer all questions. If you get stuck on something, I suggest moving on and coming back later when/if you have time. If you have a question, please raise your hand. Good luck!

Multiple choice – 25 out of 50 pts. (8 qns., 3 pts. each + 1)

Answer these questions on your Scantron. Your score will only be based on the marks on your Scantron. You will not receive any credit for anything written on your exam paper. You will receive 1 extra point for correctly writing your name, perm number, version (A,B,C, or D), and TA’s name on your Scantron. Exams without the version marked will be assigned the average score for all four versions.

1. Bob has $16, with preferences over consumption defined by $u(c) = \sqrt{c}$. Which of the following would he prefer?
   (a) pay $15 for a 50% chance of winning $80
   (b) pay $7 for a 50% chance of winning $27
   (c) pay $15 for a 10% chance of winning $99
   (d) do nothing

2. Walther owns a home in flood-prone Paradise Basin. If there is no flood the home and land together will be worth $2400. If there is a flood, Walthers home will be destroyed but the land will still be worth $900. Walther can buy flood insurance for $0.25 per dollar of coverage. Let $C_NF$ and $C_{NF}$ be the value of respective values of his land in the case of a flood or no flood. Which of the following equations represent the possible values of $C_{NF}$ and $C_{NF}$ that Walther can achieve by buying some amount of insurance?
   (a) $C_{NF} = 2700 - \frac{C_F}{3}$
   (b) $C_{NF} = 2500 - \frac{C_F}{3}$
   (c) $C_{NF} = 2700 - \frac{C_F}{3}$
   (d) $C_{NF} = 2500 - \frac{C_F}{3}$

3. Rebecca likes to drink beer. Her inverse demand for pints of beer is $p = 10 - 2q$. What is the change in Rebecca’s consumer surplus if the price of a pint of beer rises from $4 to $6?
   (a) Decreases by 5
   (b) Increases by 5
   (c) Decreases by 10
   (d) Increases by 10
4. (continued from previous question) Wei-Lun offers to supply beer to Rebecca and his supply is given by \( p = \frac{q}{2} \). Assuming that he and Rebecca are the only market participants, what is the competitive equilibrium price and quantity?

(a) \( p = 6 \) and \( q = 2 \)
(b) \( p = 8 \) and \( q = 1 \)
(c) \( p = 4 \) and \( q = 3 \)
(d) \( p = 2 \) and \( q = 4 \)

5. Anand’s demand for Scrunchies is given by \( D(p) = 80 - 4p \). What is the price elasticity of his demand when \( p = 10 \)?

(a) -2
(b) -4
(c) -1
(d) -1/4

6. (continued from previous question) Bing-En also likes Scrunchies and his inverse demand is given by \( p = 20 - \frac{q}{2} \). What price will maximize the total revenue from Anand and Bing-En’s combined purchases?

(a) 20
(b) 40
(c) 5
(d) 10

7. Inverse demand for cigarettes is \( p = 40 - 3q \) and the supply is \( q = \frac{p}{3} + 5 \). In an attempt to help addicted consumers, the government imposes a tax of 10 dollars on cigarettes. By how much does the price paid by consumers increase?

(a) 10
(b) 4
(c) 6
(d) 3

8. The supply of coffee is given by \( q = 100 + p \), while the demand is given by \( q = 120 - 4p \). The government imposes a price-ceiling at \( p = 2 \). Find the dead-weight loss.

(a) 2
(b) 15
(c) 2.5
(d) 0.5
Blue-book – 25 out of 50 pts. (2 qns., 12 pts. each + 1)

Answer these questions in your blue-book. Show your work and intermediate steps for partial credit. Points are split equally across all sub-parts. Your score will only be based on the marks in your blue-book. You will not receive any credit for anything written on your exam paper. You will receive 1 extra point for correctly writing your name, perm number, version (A, B, C, or D), and TA’s name on your blue-book.

1. Douglas has only one asset, a bike worth $200, that he keeps locked up outside overnight. With probability \( \pi_s = 0.2 \) thieves steal the wheels and seat, and he is left with only the $50 frame.

   (a) Douglas can buy as much bike-theft insurance as he would like from the Isla Vista Insurance for STudents Association (IVISTA), which charges \( p = \frac{2}{3} \) dollars per dollar of coverage. Let \( c_{ns} \) be his consumption if his bike is not stolen and \( c_s \) be his consumption when it is stolen. Write the equation of his state-contingent budget constraint, with \( c_{ns} \) isolated on the left, written as a function of \( c_s \). 

   (b) Suppose his expected utility is represented by \( U(c_s, c_{ns}) = c_s c_{ns} \). Write down his Marginal Rate of Substitution (MRS). (You can just write down the absolute value—don’t worry about the sign.)

   (c) How much does Douglas choose to pay as his insurance premium? For partial credit, you may state his optimal consumption (for each state).

   (d) Douglas has a roommate, Leon, who faces the exact same situation, but is (much) more averse to risk. In fact he can’t stand the fact that his consumption might be lower or higher depending upon whether the thieves come. His expected utility is \( U(c_s, c_{ns}) = \min\{c_s, c_{ns}\} \). What is Leon’s optimal consumption plan and how much would he pay in insurance premia?

   (e) The police arrest several of the most prolific thieves, lowering the probability of theft to \( \pi_s = 0.01 \). Describe how Leon’s behavior changes.

2. Econnerds is student-run association that offers tutoring to struggling econ students in the competitive tutoring market. Their supply of tutoring services (per hour) is given by \( S(p) = p - 20 \) and the demand for their services is \( D(p) = 100 - 2p \).

   (a) What is the equilibrium price and quantity for an hour of tutoring?

   (b) What is the resulting consumer surplus, producer surplus, and total welfare?

   (c) The Econ Department wants to encourage quality economics education, so it decides to subsidize Econnerd’s tutoring services by paying the tutors $s for every hour they work. If its goal is to lower the price that students pay by three dollars, how large must the subsidy, \( s \), be? What is the new equilibrium quantity, \( q^* \)?

   (d) Suppose the department decided to pay the subsidy to the customers, instead of the tutors. What is the new equilibrium quantity and how does it compare to the answer to the last question?

   (e) What is the deadweight loss caused by this subsidy?

   (f) What is the total amount of subsidy payments made by the Econ Department? Suppose that, instead of paying a per unit subsidy, the department decided to just give the Econnerds a lump sum amount that is equal to the total they would have paid in the subsidy. What price will consumers end up paying and what would be the DWL of this policy?