Sample exam 1

The actual final exam will have the same format as this
Answers will be posted in 3 weeks

ECO202 PRICE THEORY FALL 2019
120 Minutes
Each question is worth the same points.
Choose **any 5** questions from Each Section (5 from A plus 5 from B plus 5 from C).
Answer questions in any order. Label each question clearly.
Your questions are different from those of other students in the class.
No cellphones allowed – only personal calculators.
"Try your best; give answers as full as you can."

Section A. Choose *any five* questions. Label each question.

A1. The firm's production function is $Q = 3K^4L^2$, where Q is output, K is capital, L is labor. Denoting the wage paid to labor by w and the rental rate for capital as r, derive the conditional factor demand for capital and the cost function for this firm.

A2. Assume a firm selling laptops has monopoly power. What is the mark-up if the price elasticity of demand for laptops is -2? If the firm sells laptops at price $20 each, what is the firm's marginal cost?

A3. Assume a firm makes cars but its capital is fixed in the short run. Using the production function and iso-profit lines, show what happens to the optimal quantity of labor hired if the firm decides it wants to make more profit.

A4. You manage a bagel factory in a perfectly competitive market. The cost of production is $C = 10+5Q^2$, where Q is output and C is total cost. If the price of a bagel is $20, how many bagels should you produce? How much profit will you make? Is this a long-run equilibrium?

A5. Assume a firm sells tennis balls with a demand curve $Q = 10–0.2P$. The firm has a constant marginal cost of MC=10. What is the profit-maximizing level of output? What price will the firm charge? What is the price elasticity of demand at the profit-maximizing output?

A6. Show using budget constraints and indifference curves why an increase in the wage rate might actually reduce hours worked and increase hours of leisure.

A7. Your friend offers you a coin-toss gamble. If heads, you get $150. If tails, you lose $20. Your utility function for income Y is $U(Y) = (100 + Y)^{1/3}$. Should you take the gamble? If another friend offers you $5 to let him take the gamble, should you take the certain $5 instead of the gamble?

A8. A monopolist has a demand curve P=100 – Q and MC=AC=20. If the monopolist spends $A to hire an advertising company, the demand curve becomes P=120 – Q. If A=$600, should the monopolist hire the advertising company?

Section B. Choose *any five* questions. Label each question.

B1. Who benefits if the government sets a price floor above the market price?

B2. How should a monopolist be regulated?

B3. Show how the long-run price of soccer balls might increase with changes in the demand for soccer balls, even if the industry is perfectly competitive.

B4. You operate in an oligopolistic market. How might you keep this market stable?

B5. What are the main ways firms can price discriminate?

B6. Why is the principal-agent problem a "problem"?

B7. What determines if a person has preferences that are risk loving or risk averse?

B8. In terms of their welfare properties, how do monopoly markets and perfectly competitive markets differ? Which is preferable?

Section C. Choose *any five* questions. Label each question.

C1. If Q=16-2P, what is the price elasticity of demand when the price of the good is \$2? You sell this good; should you increase the price to \$3? Does the price of \$3 maximize Total Revenue?

C2. The monopolist faces a demand curve of $Q_D = 100-2P$. Its cost function is $C(Q) = 2Q$. What is the optimal level of output? What will the price be? How much profit will the monopolist make?

C3. Jin has a utility function $U = 10I^{0.5}$, where I is annual income in thousands of dollars. Jin currently earns \$40,000 ($Y = 40$).

(a) Is Jin risk loving, risk neutral, or risk averse? Explain.

(b) Jin currently earns \$40,000 ($Y = 40$) and can earn that income next year with certainty. She is offered a new job with a 0.6 probability of earning \$44,000 and a 0.4 probability of earning \$33,000. Should she take the new job?

(c) Assume Jin takes the new job What amount of insurance would Jin be willing to pay to protect against the variable income associated with this new job?

C4. A firm's revenue R is given by $R = 10e–e^2$, where e is effort per worker. Workers choose their effort to maximize wage less effort $w–e$. The per-unit cost of effort equals 1. Determine the effort and profit for the following wage arrangements. Which arrangement is preferable?

$$w = R/4 \qquad\qquad w = R–10$$

C5. Kodak is a monopolist in the camera market with a demand curve $P = 10–Q_K$ and $MC = AC = 1$ (where Q_K is the output by Kodak). What is the optimal price and quantity? What is the supernormal profit? Imagine now that Fuji enters the camera market such that $P = 10–Q_K–Q_F$ where Q_F is the output by Fuji. If $Q_K = 6$, what is the optimal price and quantity for Fuji? Is this a stable equilibrium?

C6. The marginal product of labor is 5 units of output per hour and the wage is \$10. The marginal product of capital is 10 units of output per hour, how much should the firm be willing to pay for capital?

C7. A bidder is offered a bottle of wine that can be sold for \$100 in three years' time. The bidder can borrow money at a 20% interest rate. Rounded to the nearest ten dollars, what is the most the bidder should pay for the bottle now?

C8. How do economies of scale and economies of scope differ?

C9. Which type of auction maximizes revenue for the seller? Explain why.