

Name: _____

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Principles of Microeconomics — Practice Exam

Instructions: Answer ALL questions. Part A has 12 multiple-choice questions with exactly one correct option each. Part B has 13 problems; show your working for every calculation. A calculator may be used. Time allowed: 60 minutes.

Time Limit: 60 minutes

Multiple Choice (12 questions)

- [2 points] 1. A bumper harvest lowers the market price of apples, and shoppers buy more apples than before. In the market for apples, this is best described as:
- A. a rightward shift of the demand curve for apples, because buyers want more
 - B. a movement down along the demand curve for apples, caused by a rightward shift of the supply curve
 - C. a leftward shift of the supply curve for apples, caused by the lower price
 - D. a movement along the supply curve for apples, caused by a rightward shift of the demand curve
- [2 points] 2. Which of the following would shift the supply curve of bread to the LEFT?
- A. A rise in the market price of bread
 - B. A fall in the price of flour
 - C. A rise in the wages of bakery workers
 - D. An increase in the number of bakeries
- [2 points] 3. The weekly market for second-hand textbooks on a campus has demand $Q_d = 150 - 3P$ and supply $Q_s = 30 + 2P$, where P is the price in dollars and Q is books per week. The equilibrium price and quantity are:
- A. $P = 24, Q = 78$
 - B. $P = 30, Q = 60$
 - C. $P = 36, Q = 42$
 - D. $P = 24, Q = 102$

- [2 points] 4. In a city, a new subway line opens, so fewer people want taxi rides at any given fare. In the same month, the city issues many more taxi licences. In the market for taxi rides:
- A. the equilibrium fare falls; the change in the equilibrium number of rides cannot be determined without knowing the sizes of the two shifts
 - B. the equilibrium number of rides falls; the change in the equilibrium fare cannot be determined
 - C. both the equilibrium fare and the equilibrium number of rides fall
 - D. neither the change in the fare nor the change in the number of rides can be determined
- [2 points] 5. A video streaming service raises its monthly price from 12 dollars to 15 dollars. Its number of subscribers falls from 2.0 million to 1.8 million. Using the midpoint method, the price elasticity of demand and the effect on the service's monthly revenue are:
- A. $PED = -0.40$; demand is inelastic and revenue rises
 - B. $PED = -2.1$; demand is elastic and revenue falls
 - C. $PED = -0.47$; demand is inelastic and revenue rises from 24 million to 27 million dollars
 - D. $PED = -0.47$; demand is inelastic and revenue falls
- [2 points] 6. A bookshop cuts the price of a bestseller by 10 percent and finds that its total revenue from the book rises. Over this range of prices, demand for the book must be:
- A. price inelastic, because the lower price attracted more buyers
 - B. price elastic, because the quantity sold rose by more than 10 percent
 - C. unit elastic, because revenue depends on both price and quantity
 - D. price inelastic, because the quantity sold rose by less than 10 percent
- [2 points] 7. When average household incomes rise by 8 percent, the quantity of restaurant meals demanded rises by 12 percent, other things being equal. The income elasticity of demand for restaurant meals is:
- A. $+0.67$; restaurant meals are a normal good and a necessity
 - B. -1.5 ; restaurant meals are an inferior good
 - C. $+1.5$; restaurant meals are a normal good and a necessity
 - D. $+1.5$; restaurant meals are a normal good and income elastic (a luxury)
- [2 points] 8. The monthly market for rented storage lockers near a university has demand $Q_d = 500 - 5P$ and supply $Q_s = 100 + 3P$, where P is the rent in dollars per month. The university caps the rent at 30 dollars per month. The result is:
- A. a shortage of 160 lockers
 - B. a shortage of 100 lockers
 - C. a shortage of 60 lockers
 - D. a surplus of 160 lockers

- [2 points] 9. A per-unit tax is imposed on the sellers of a good for which demand is highly price elastic and supply is highly price inelastic. Most of the burden of the tax will fall on:
- A. buyers, because the tax is collected from sellers, who pass it on in a higher price
 - B. buyers, because demand is more price elastic than supply
 - C. buyers and sellers equally, because who the tax is collected from does not matter
 - D. sellers, because the side of the market that is less price elastic bears the larger share of a tax
- [2 points] 10. The daily demand for passenger crossings on a ferry is $Q_d = 100 - 2P$, where P is the fare in dollars. The fare is 30 dollars. Consumer surplus per day is:
- A. 800 dollars
 - B. 400 dollars
 - C. 1,200 dollars
 - D. 1,000 dollars
- [2 points] 11. The price of locally grown tomatoes rises from 1.75 dollars to 2.25 dollars per kilogram. Within the same growing season, growers raise the quantity supplied from 7,600 to 8,400 kilograms per week. Using the midpoint method, the price elasticity of supply over this range is:
- A. 2.5; supply is price elastic
 - B. 0.1; supply is price inelastic
 - C. 0.4; supply is price elastic, because growers responded within the season
 - D. 0.4; supply is price inelastic
- [2 points] 12. The government pays producers of solar panels a subsidy of 50 dollars per panel sold. Assuming an ordinary downward-sloping demand curve and upward-sloping supply curve, the subsidy will:
- A. lower the price paid by buyers by the full 50 dollars and leave the quantity sold unchanged
 - B. raise the amount received by sellers by the full 50 dollars and leave the price paid by buyers unchanged
 - C. lower the price paid by buyers, raise the amount received by sellers, and increase the quantity sold, with the gap between the two prices equal to 50 dollars
 - D. raise the price paid by buyers, because the subsidy increases demand for panels

Short Answer (10 questions)

- [4 points] 13. The weekly market for reusable water bottles in a town is described by the following linear demand and supply equations, where P is the price in dollars per bottle and Q is the number of bottles per week.
- $$Q_d = 240 - 4P, \quad Q_s = -60 + 6P$$

[2 points] (a) Calculate the equilibrium price and quantity. Show your working.

[2 points] (b) Calculate consumer surplus, producer surplus and total surplus at the equilibrium. A sketch of the two curves may help.

[3 points] 14. Simultaneous shifts. In the same month, the government introduces a rebate paid to households that buy a home solar battery, and the world price of lithium, the main input in these batteries, falls sharply.

[1 point] (a) State which curve each event shifts in the market for home solar batteries, and in which direction.

- [2 points]** (b) Using a diagram or careful reasoning, state what happens to the equilibrium quantity and to the equilibrium price. For whichever of the two cannot be determined, explain what it depends on.

- [3 points]** 15. A municipal swimming pool raises its adult entry fee from 5 dollars to 7 dollars. Monthly adult visits fall from 9,000 to 7,000.

- [2 points]** (a) Using the midpoint method, calculate the price elasticity of demand for pool visits over this price range. Show your working and state whether demand is elastic or inelastic.

- [1 point]** (b) Calculate the pool's monthly revenue from adult entry before and after the fee rise, and explain whether the change is consistent with your answer to part (a).

- [2 points]** 16. Income and cross elasticity of demand. Answer both parts using the data given.

[1 point] (a) During a recession, average incomes fall by 5 percent and the quantity of long-haul flights demanded falls by 12 percent, other things being equal. Calculate the income elasticity of demand for long-haul flights and classify the good.

[1 point] (b) The price of petrol rises by 15 percent and the quantity of large sport utility vehicles demanded falls by 6 percent, other things being equal. Calculate the cross elasticity of demand for large SUVs with respect to the price of petrol and state the relationship between the two goods.

[3 points] 17. After a storm, the daily market for cases of bottled water in a town has the following demand and supply, where P is the price in dollars per case and Q is cases per day. A state anti-price-gouging law caps the price at 4 dollars per case.

$$Q_d = 2,000 - 100P, \quad Q_s = 200 + 200P$$

[2 points] (a) Calculate the equilibrium price and quantity that would occur without the cap, and the size of the shortage at the capped price.

- [1 point]** (b) At the capped price, only the quantity sellers supply is available. Use the demand equation to find the highest price some buyers would be willing to pay for the last case actually supplied, and explain what this implies about how the available cases get allocated.

- [3 points]** 18. The weekly market for fresh milk in a region has the following demand and supply, where P is the price in dollars per litre and Q is thousands of litres per week. To support dairy farmers, the government sets a minimum price of 4 dollars per litre.

$$Q_d = 1,200 - 200P, \quad Q_s = 300 + 100P$$

- [2 points]** (a) Calculate the equilibrium price and quantity without the price floor, and the size of the surplus at the minimum price.

- [1 point]** (b) If the government agrees to buy the entire surplus at the minimum price, calculate what it spends each week.

- [4 points]** 19. The weekly market for lawn fertilizer in a region has the following demand and supply, where P is the price in dollars per kilogram and Q is thousands of kilograms per week. To reduce nitrogen run-off into rivers, the government imposes a levy of 0.60 dollars per kilogram, collected from sellers.

$$Q_d = 500 - 100P, \quad Q_s = -100 + 200P$$

[1 point] (a) Calculate the equilibrium price and quantity before the levy, and the quantity traded after it.

[1 point] (b) Calculate the price buyers pay and the price sellers keep after the levy, and state how much of the 0.60 dollars falls on each side of the market.

[1 point] (c) Calculate the government's weekly revenue from the levy.

[1 point] (d) Calculate the deadweight loss caused by the levy.

[3 points] 20. The monthly market for home insulation installation in a region has the following demand and supply, where P is the price in dollars per square metre and Q is thousands of square metres per month. The government pays installers a subsidy of 5 dollars per square metre installed.

$$Q_d = 800 - 20P, \quad Q_s = -200 + 30P$$

[1 point] (a) Calculate the equilibrium price and quantity before the subsidy, and the quantity installed after it.

[1 point] (b) Calculate the price households pay and the amount installers receive per square metre (including the subsidy) after the policy, and state how the 5 dollars is split between the two sides.

[1 point] (c) Calculate the monthly cost of the subsidy to the government and the deadweight loss it creates.

[3 points] 21. The weekly market for short-term holiday rentals in a seaside town has the following demand and supply, where P is the price in dollars per night and Q is rental nights per week.

$$Q_d = 1,000 - 10P, \quad Q_s = -200 + 10P$$

[1 point] (a) Calculate the equilibrium price and quantity, and the consumer surplus and producer surplus at the equilibrium.

[2 points] (b) The town council limits short-term rentals to 300 nights per week, allocating the permits free of charge to existing hosts. Calculate the new market price, the deadweight loss caused by the limit, and the change in producer surplus. Explain why hosts as a group may support the limit.

[2 points] 22. Deadweight loss in words. A per-unit tax is imposed on a good with an ordinary downward-sloping demand curve and upward-sloping supply curve, and the quantity traded falls.

- [1 point]** (a) Explain, without numbers, why the tax creates a deadweight loss, and why the revenue the government collects is NOT part of that loss.

- [1 point]** (b) Describe a case in which a per-unit tax would raise revenue but create no deadweight loss, and explain why.

Calculations (3 questions)

- [2 points]** 23. The weekly market for electric kettles in a region has demand $Q_d = 400 - 5P$ and supply $Q_s = 100 + 5P$, where P is the price in dollars and Q is kettles per week. A rise in household incomes raises the quantity demanded by 80 kettles at every price. Calculate the original and the new equilibrium price and quantity, and state whether the change in the quantity of kettles supplied is a shift of the supply curve or a movement along it.

[2 points] 24. The daily demand for tickets to a city museum is $Q_d = 300 - 6P$, where P is the ticket price in dollars and Q is visitors per day. Calculate the point price elasticity of demand at a price of 20 dollars, state whether demand is elastic or inelastic at that price, and find the price at which demand is unit elastic.

[2 points] 25. The price of recycled aluminium rises from 1,400 dollars to 1,800 dollars per tonne. Over the following year, the quantity supplied by recycling firms rises from 4,000 to 6,000 tonnes per month. Using the midpoint method, calculate the price elasticity of supply over this range and state whether supply is elastic or inelastic. Explain briefly why the elasticity measured over a year is likely to be larger than the elasticity measured over a single week.