

AMERICAN UNIVERSITY of BEIRUT
SCHOOL of BUSINESS
BUSS 230

MID-TERM EXAM – November 28, 2001

NAME: _____ ID: _____

SECTION: _____ INSTRUCTOR: _____

ANSWER ALL QUESTIONS – TIME ALLOWED: 1 ½ hours

I. Multiple choice - (30 points). Circle the correct answer

1. Consider a firm that employs some resources that are provided by its owners. When economic profit is zero, accounting profit is:
 - a. Positive and normal profit is zero.
 - b. Zero and normal profit is zero also.
 - c. Negative and normal profit is negative.
 - d. Positive and normal profit is positive.
 - e. Indeterminate. More information is required.
2. The management of a basketball team is considering a plan in which fans who donate blood can attend a series of games for the discounted price of L.L. 15,000 a game instead of the usual price of L.L. 20,000 a game. If both ticket revenues and blood donations rise after the plan is put in effect, then the following is true:
 - a. The demand for the team's tickets is price elastic.
 - b. The demand for the team's tickets is price inelastic.
 - c. The demand for blood donations is price elastic.
 - d. The demand for blood donations is price inelastic.
 - e. None of the above.
3. To test whether an overall regression equation is statistically significant, one uses:
 - a. The t-statistic.
 - b. The R-statistic.
 - c. The F-statistic.
 - d. The standard error statistic.
 - e. All of the above.
4. In a **SIMULTANEITY** situation, a demand function is said to be identified if:
 - a. The supply function contains at least one endogenous variable that is not contained in the demand function.
 - b. The supply function contains at least one exogenous variable that is not contained in the demand function.

- c. The demand function contains at least one endogenous variable that is not contained in the supply function.
 - d. The demand function contains at least one exogenous variable that is not contained in the supply function.
 - e. The reduced form function of both demand and supply contains only identified variables.
5. Which of the following events would lead to a **DECREASE** in the demand for tennis balls?
- a. An increase in the price of tennis balls.
 - b. A decrease in the price of tennis rackets.
 - c. An increase in the cost of producing tennis balls.
 - d. An increase in average income (assuming tennis balls are a normal good).
 - e. None of the above.
6. In a regression equation, the _____ captures the effects of factors that influence the dependent (Y) variable but that are not used as explanatory variables.
- a. Intercept.
 - b. Slope coefficient.
 - c. R-square.
 - d. Random error term.
 - e. Both "a" and "b".
7. For a constrained minimization problem, the decision maker
- a. Is constrained by the level of total benefits.
 - b. Is constrained by the values established for the activities.
 - c. Seeks to minimize the cost of achieving a specific goal.
 - d. Is guided by all of the above (a, b, and c).
 - e. Is not guided by any of a, b, or c.
8. A price-taking firm can exert no control over price because:
- a. It does not control the demand for its product.
 - b. Substitutes are lacking for the firm's product.
 - c. The firm's individual production is insignificant relative to production in its industry.
 - d. Many other firms produce a product that is nearly identical to the firm's product.
 - e. Of conditions indicated in choices "c" and "d".
9. Which of the following will **NOT** affect the elasticity of demand for a product?
- a. The number of substitutes.
 - b. How long consumers have to adapt to price changes.
 - c. The cost of producing the product.
 - d. The percentage of the consumer's budget spent on the product.
 - e. All of the above factors will affect the elasticity of demand

10. In order to minimize the net loss to society from air pollution, the level of pollution should be:
- Zero.
 - The level at which the marginal benefit from pollution equals the marginal cost of pollution.
 - The level at which the total benefit from pollution equals the total cost of pollution.
 - The level at which the marginal benefit from pollution equals the marginal cost of pollution reduction.
 - The level at which the total benefit from pollution equals the total cost of pollution reduction.
11. The method of two-stage least squares (2SLS) is used in preference to ordinary least squares (OLS):
- When none of the functions to be estimated is identified.
 - When the demand and supply functions do not change.
 - When the exogenous variables are common to the demand and supply functions.
 - All of the above (a, b, and c).
 - None of the above (a, b, or c).
12. Assume that scientists have developed bacteria that will lower the freezing point of agricultural products. This invention could save farmers billions a year in crops now lost to frost damage. If this invention becomes widely used, what would happen to equilibrium price and quantity in, for example, the potato market?
- Price will decrease and quantity will decrease.
 - Price will decrease but quantity will increase.
 - Price will increase but quantity will decrease.
 - Price will increase as will quantity.
 - The change in equilibrium price and quantity is indeterminate.
13. When Marginal Revenue is positive,
- Demand is elastic.
 - Marginal revenue is greater than price.
 - Lowering price will lower total revenue.
 - Raising price will raise total revenue.
 - The demand curve is a linear function.
14. When the choice variable changes in discrete amounts, the decision rule for an unconstrained maximization situation is:
- If $MB > MC$, increase the activity.
 - If $MB < MC$, decrease the activity.
 - Choose the activity so that the net benefit is zero.
 - All of the above.
 - None of a, b, or c.

15. If the analyst believes that more than one explanatory variable explains the variation in the dependent variable (Y), then he should use the following method of estimation:
- Simple linear regression model.
 - Multiple regression model.
 - Model with more than one independent variable.
 - Multi-stage estimation model.
 - Both b and c.

II. True/False – 20 points. On your blue book, label each of the following statements as either T (true) or F (false) and briefly justify the answer.

- If the own price elasticity of demand for women's luxury handbags is found to be "- 0.8" at the current selling price, then the MR at that price is negative.
- The decline in interest rates throughout the world during this year – 2001- has raised the value of business firms.
- The principal-agent problem occurs whenever the owner of a firm has difficulty recruiting a principal agent.
- Economic profit is the difference between explicit revenues and implicit costs.
- Multicollinearity in a regression estimate refers to the situation where all the error terms in a regression are linearly related.
- A manager could reasonably expect to use price of inputs, prices of substitutes, and consumer income in a single equation demand model.
- In a cost function that relates total cost to total output, the average cost may be calculated by taking the first derivative of the function with respect to output.
- A linear functional form for a demand relation assumes that price elasticities are constant for that relation.
- If the first order condition is satisfied, then the solution to an optimization problem is a maximum.
- For a nonlinear demand function of the form $Q = a.P .M . Pr$, the estimated cross-price elasticity of demand is b.

III. (20 points) Following are some estimates of a linear regression of Sales on Prices and Income that was estimated from 25 observations:

Dependent Variable (Y): **SALES**

	Coefficient	Standard error	t-ratio
Intercept	_____	1.105	2.205
<u>Independent variables (Xs)</u>			
Own price	-0.3750	_____	- 1.570
Income	_____	0.140	2.780
Price of substitute	6.2500	1.950	_____
Source of Variation	DoF	Sum of Squares	Mean Squares

Regression	_____	187.343	_____
Residual	_____	_____	18.625
Total	_____	_____	_____
R-Square	_____		
F-Ratio	_____		

- For 10 points.** In your blue book, indicate the values of all the missing information (11 blank lines shown above)
- For 5 points.** Determine which of the variables (if any) are statistically significant at the 5 percent level of significance.
- For 5 points.** Determine whether the independent variables explain a significant proportion (at the 5 % level) of the variation in the dependent variable.

IV. **(15 points).** Using the generalized linear demand function with the form

$$Q_d = 680 - 9P + 0.006M - 4Pr$$

- For 6 points.** Calculate: the price, income, and cross elasticities at the market clearing price when $M = 15000$; $Pr = 20$ and the supply function is $Q_s = 30 + 3P$.
- For 3 points.** What is the Marginal Revenue at the market clearing price. Explain how you calculated your answer.
- For 3 points.** Is the good normal or inferior? Is it a substitute or complement for the related good? Justify your answer.
- For 3 points.** With $M = 15000$, $Pr = 20$, and the assumed supply function $Q_s = 30 + 3P$, what would occur in the market if a price ceiling of $P = 40$ were to be imposed by the government? Justify your answer.

V. **For 15 points.** An industry is characterized by the following demand and supply functions:

$$Q_d = 212 - 20P$$

$$Q_s = 20 + 4P$$

- For 3 points.** What are the equilibrium price and quantity?
- For 3 points.** If the government establishes a price ceiling of \$6 per unit, what quantity will be demanded and supplied? Draw a graph representing this market situation.
- For 3 points.** If the government establishes a floor price of \$9 per unit, what quantity will be demanded and supplied? Draw a graph representing this market situation.
- For 3 points.** If supply shifts and the new function is $Q_{s1} = 20 + 12P$ what will be the new equilibrium price and quantity. Draw a graph representing the changed market situation.
- For 3 points.** If demand changes to $Q_{d1} = 260 - 18P$ and the supply is as given in the previous part of this problem (part d), what will be the new equilibrium price and quantity? Draw a graph representing the changed market situation.

Critical t-Values

Degrees of freedom	Significance level			
	0.10	0.05	0.02	0.01
1	6.314	12.706	31.821	63.657
2	2.920	4.303	6.965	9.925
3	2.353	3.182	4.541	5.841
4	2.132	2.776	3.747	4.604
5	2.015	2.571	3.365	4.032
6	1.943	2.447	3.143	3.707
7	1.895	2.365	2.998	3.499
8	1.860	2.306	2.896	3.355
9	1.833	2.262	2.821	3.250
10	1.812	2.228	2.764	3.169
11	1.796	2.201	2.718	3.106
12	1.782	2.179	2.681	3.055
13	1.771	2.160	2.650	3.012
14	1.761	2.145	2.624	2.977
15	1.753	2.131	2.602	2.947
16	1.746	2.120	2.583	2.921
17	1.740	2.110	2.567	2.898
18	1.734	2.101	2.552	2.878
19	1.729	2.093	2.539	2.861
20	1.725	2.086	2.528	2.845
21	1.721	2.080	2.518	2.831
22	1.717	2.074	2.508	2.819
23	1.714	2.069	2.500	2.807
24	1.711	2.064	2.492	2.797
25	1.708	2.060	2.485	2.787
26	1.706	2.056	2.479	2.779
27	1.703	2.052	2.473	2.771
28	1.701	2.048	2.467	2.763
29	1.699	2.045	2.462	2.756
30	1.697	2.042	2.457	2.750
40	1.684	2.021	2.423	2.704
60	1.671	2.000	2.390	2.660
120	1.658	1.980	2.358	2.617
∞	1.645	1.960	2.326	2.576

Source: Adapted with permission from R. J. Wonnacott and T. H. Wonnacott, *Econometrics*, 2nd ed. (New York: John Wiley & Sons, 1979).