ECP 6705
Sample Mid Term
Students may use a calculator and one, 8.5 x 11 cheat sheet with formulas and other information.

MULTIPLE CHOICE (2 points each)

1. In time series data, the long-run change in a variable determined solely by the passage of time is the
   A. irregular variation.
   B. seasonal variation.
   C. cyclical variation.
   D. trend.
   E. time-varying series.

2. A perfectly competitive market is a group of
   A. many individuals' and firms' trading a good or service.
   B. individuals' and firms' trading many goods and services.
   C. businesses organized into a cartel.
   D. farmers' selling produce.
   E. businesses' selling many different products.

3. Along a demand curve with unitary elasticity everywhere, total revenue
   A. increases as output increases.
   B. decreases as output increases.
   C. remains constant as output increases.
   D. increases and then decreases as output increases.
   E. decreases and then increases as output increases.

4. Marginal revenue can be defined as the
   A. percent increase in total revenue resulting from a 1 percent increase in output.
   B. increase in total revenue resulting from a 1 unit increase in output.
   C. total revenue divided by output.
   D. average revenue multiplied by output.
   E. average revenue multiplied by output divided by 4.

5. The plot of a variable that grows by a constant percentage amount each period against time is
   A. a concave curve.
   B. a linear curve.
   C. an exponential curve.
   D. a logarithmic curve.
   E. a and b.

6. Whenever average profit is less than marginal profit,
   A. average profit declines with increases in output.
   B. marginal profit decreases with increases in output.
   C. marginal profit increases with increases in output.
   D. average profit is maximized.
   E. average profit increases with increases in output.
7. A market demand curve is likely to shift to the right when
   A. average income falls.
   B. prices fall.
   C. prices rise.
   D. population increases.
   E. new firms enter the market.

8. A function of one argument is maximized when the first derivative
   A. is zero and the second derivative is positive.
   B. is positive and the second derivative is negative.
   C. is zero and the second derivative is negative.
   D. is negative and the second derivative is positive.
   E. and the second derivative are both zero.

9. The first derivative of total profit with respect to quantity is
   A. average revenue.
   B. marginal revenue.
   C. marginal profit.
   D. average profit.
   E. total profit.

10. One economist wrote, "Demand is likely to be more elastic, or less inelastic, over a long period of
    time ..." If he is correct, what must be true?
    A. The long-run demand curve is steeper.
    B. Long-run income is higher.
    C. The short-run demand curve is steeper.
    D. The effect of advertising increases.

11. The market demand curve shows, ceteris paribus, the quantity of a good or service
    A. households would sell at various prices.
    B. households would buy at various outputs.
    C. firms would sell at various prices.
    D. firms would buy at various prices.
    E. households would buy at various prices.

12. If price is $25 when the elasticity of demand is -0.5, then marginal revenue should be
    A. $50.
    B. -$25.
    C. $12.50.
    D. $37.50.
    E. $25.

13. The use of consumer interviews to estimate demand functions has been criticized because
    A. answering surveys takes too much time.
    B. the answers collected cannot be easily quantified.
    C. respondents don't have strong incentives to answer accurately.
    D. interviewers are often belligerent.
    E. survey questions are difficult to word clearly.
14. Along a linear demand curve, total revenue is maximized
   A. where the slope of a line from the origin to the demand curve is equal to the elasticity.
   B. where the elasticity is 1.
   C. near the quantity axis intercept.
   D. near the price axis intercept.
   E. where the elasticity is 0.

15. The demand for personal computers has been estimated to be Q = 500,000 - 700P + 200I - 500S. Assume that per capita income I is $13,000 and the average price of software S is $400. At price P = $3,000, the price elasticity of demand is
   A. -2.625.
   B. -7.0.
   C. -1.0.
   D. -21.0.
   E. -4.25.

16. "Colombia, Brazil Advance Proposal to Withhold 10 Percent of Export Output" (Wall Street Journal, September 23, 1991, p. B6). A Colombian delegate to the International Coffee Organization said that if all its members withheld 10 percent of export output, the international price would rise 20 percent. This statement implies the elasticity of demand for coffee is approximately
   A. -0.00.
   B. -5.00.
   C. -2.00.
   D. -0.20.
   E. -0.50.

17. A profit maximizing firm sets its price
   A. to maximize sales.
   B. so that the demand is elastic.
   C. to equate average revenue and average cost.
   D. at the highest level possible.
   E. where marginal profit is maximized.

18. In managerial economics, managers are assumed to maximize
   A. current profits.
   B. their take home pay.
   C. their employees welfare.
   D. the value of their firm.
   E. social welfare.

19. The estimated mathematical relationship between dependent and independent variables derived using ordinary least squares is called the
   A. covariance.
   B. sample regression line.
   C. residual demand curve.
   D. goodness of fit.
   E. coefficient of determination.
20. The period in a business cycle where national output is growing relative to its full employment level is the
   A. recession.
   B. trough.
   C. peak.
   D. expansion.
   E. crunch.

21. As we move down a linear demand curve, demand becomes
   A. more elastic.
   B. less elastic at first and then more elastic.
   C. steeper.
   D. more elastic at first and then less elastic.
   E. less elastic.

22. The coefficient of determination from a regression represents the
   A. proportion of variation in the dependent variable explained by variation in the independent variables.
   B. proportion of variation in the independent variables explained by variation in the dependent variable.
   C. variation in the dependent variable.
   D. proportion of the variation in the dependent variable.
   E. proportion of the variation in the independent variable.

23. The demand for fashion watches is \( Q = 9 - 0.7P + 2I \). Assume that per capita income \( I \) is $13. At a price \( P \) of $30, the price elasticity of demand is
   A. -0.66.
   B. -1.0.
   C. -2.0.
   D. -0.5.
   E. -1.5.

24. Economic profits may result from
   A. innovation.
   B. risk or uncertainty.
   C. monopoly power.
   D. all the above.
   E. a and b only.

25. If \( Y = -2 + X + 32X^3 \), then \( dY/dX \) is
   A. \( 1 + 96X^3 \).
   B. \(-1 + 96X^2 \).
   C. \( 1 + 96X^2 \).
   D. \( 96X^2 \).
   E. \( X + 32X^3 \).
SHORT ANSWER (10 points each)

ANSWER QUESTIONS 1 and 2.

1. Assume that a local limousine company has strong market power in the area where it operates. As a new employee for the company, you believe the demand curve is given by

\[ Q = 287.5 - 2.5P + .5I + 0.1A \]

where \( Q \) is the number of limousine packages. I currently equals $35 and A (advertising spending) currently equals $200.

A. What is the firm’s demand curve?
B. If the sales force wants to maximize revenue, what price will they charge?

2. The following data apply to healthcare spending in the United States.

<table>
<thead>
<tr>
<th>Age Bracket (for Head of Household)</th>
<th>Average Age</th>
<th>Healthcare Spending</th>
</tr>
</thead>
<tbody>
<tr>
<td>55-64</td>
<td>59.1</td>
<td>$2450</td>
</tr>
<tr>
<td>65-74</td>
<td>69.3</td>
<td>2990</td>
</tr>
</tbody>
</table>

A. Calculate the elasticity of healthcare spending with respect to average age across these two groups.
B. Give one reason why a healthcare-industry executive would prefer to look at the derivative, \( d(HS)/dt \), as opposed to the elasticity?

ANSWER 3 OF THE FOLLOWING.

3. The following model has been estimated for sales of your company. Revenue is in millions and has been modeled as a function of a time index.

\[ R(t) = 24.92 + 0.32t \]

The following seasonal adjustment factors have also been calculated for your company (norm = 100).

<table>
<thead>
<tr>
<th>January</th>
<th>81</th>
<th>July</th>
<th>104</th>
</tr>
</thead>
<tbody>
<tr>
<td>February</td>
<td>80</td>
<td>August</td>
<td>101</td>
</tr>
<tr>
<td>March</td>
<td>102</td>
<td>September</td>
<td>79</td>
</tr>
<tr>
<td>April</td>
<td>76</td>
<td>October</td>
<td>101</td>
</tr>
<tr>
<td>May</td>
<td>137</td>
<td>November</td>
<td>74</td>
</tr>
<tr>
<td>June</td>
<td>122</td>
<td>December</td>
<td>125</td>
</tr>
</tbody>
</table>

A. Calculate a revenue forecast for April - June (t=4 - 6) that is not seasonally adjusted.
B. Calculate a forecast that is seasonally adjusted.

4. Assume that Eckert Incorporated is the only firm producing a particular industry. As an analyst for the company, you believe the demand function is given by

\[ Q = 500 - 10P + 20I + 0.1A \]

I currently equals $35 and A currently equals $200.
A. The Eckert family has always charged $5 for the product. If I increases from $35 to $135, what happens to price elasticity?

B. At the new income level, what is the income elasticity?

5. For at time, Napster basically had a monopoly on music exchanges and the company did not charge users anything. At the height of the company’s popularity, however, customers could not download songs easily.

A. Graph the disequilibrium that occurred when the firm forced the price of a song download to zero (hint: be sure to show the shortage in song downloads that followed).

B. Some suggested a flat monthly fee for Napster membership where the proceeds will be split between Napster, the record companies and the artists. Why is this unlikely to help the market reach an equilibrium in song downloads (hint: think about direct pricing versus indirect pricing)?

6. Suppose the local hockey team plays in an arena with a seating capacity of 10,000. However, during the past season, attendance only averaged 5,000. The average ticket price was $12.

A. Assume the price elasticity is -4 and calculate the price that would fill the arena.

B. If the price were decreased to $11 and average attendance increased to 6,000, what is the price elasticity?

C. In the entertainment industry, price breaks are only granted for marginal sales, once management has decided the event will not sell out. Why does the first customer agree to pay more than the last customer?