PART A

INSTRUCTIONS: 1. THERE ARE FOUR (4) QUESTIONS IN THIS PART.
2. ANSWER ALL QUESTIONS.

Question 1

a. Given the following news caption:

KUALA LUMPUR, June 30, Wednesday - Prime Minister Abdullah Ahmad Badawi said the government may review the country's economic growth forecast in view of skyrocketing oil prices. The effects from persistent high oil prices was something the country has to accept, he was quoted as saying by the Bernama news agency. Malaysia, a net oil producer, has forecast a gross domestic product of five to six percent for this year down from 7.1 percent last year. Abdullah did not elaborate. Last week Second Finance Minister Nor Mohamed Yakcop said Malaysia was concerned high oil prices will hurt its developed-nation trading partners, although in the short term it will benefit as the value of its oil exports rises. "It is a concern because the higher oil prices may affect the growth of the developed countries. We are a trading nation so it is a concern," he said. Crude futures tumbled on Tuesday a day after surging to a new record close of 61 dollars per barrel in New York, on concerns that refineries will struggle to meet strong demand for energy during the fourth quarter, particularly from the United States and China. - AFP/mks.

Based on the above news caption, answer the followings:

i. How do you measure the value of a firm? What is the likely impact of further increases in global oil prices on a firm's value? Explain.

[3 marks]

ii. Assuming rising oil prices would bring about disastrous effects on firms' profits, why certain firms and industries in the country might experience the opposite? Explain.

[3 marks]
b. If the goal of the firm is both short- and long-run profit maximisation, explain:

i. why a firm may sacrifice short-run profits for long-run growth and profitability.

[3 marks]

ii. how and why the management team of the firm may have different objectives (goals) than the owners of the firm.

[3 marks]

iii. how the owners of the firm can bring the management team’s objectives (goals) to be consistent with the owners’ goals.

[3 marks]

[TOTAL: 15 MARKS]

Question 2

Ramly Burger collected data on sales of its main product, burger, at several major towns in Peninsular Malaysia. Other related data were also collected. Since you have taken the BMME5103 course in OUM, the production manager asks you to estimate a demand function. The result of your estimation is shown in Figure 1 below.

FIGURE 1: REGRESSION MODEL

Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.949(a)</td>
<td>.901</td>
<td>.889</td>
<td>1,663.042</td>
</tr>
</tbody>
</table>

Predictors: (Constant), Pop, PriceC, Price, Advert, Income
### ANOVA (b)

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>1054152792.412</td>
<td>5</td>
<td>210830558.42</td>
<td>76.230</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>116159707.588</td>
<td>42</td>
<td>2765707.324</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1170312500.000</td>
<td>47</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Predictors: (Constant), Pop, PriceC, Price, Advert, Income
- Dependent Variable: Quantity

### Coefficients (a)

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>Std. Error</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Beta</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>-5831.522</td>
<td>5740.516</td>
<td>-1.016</td>
<td>.316</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Price</td>
<td>-32.549</td>
<td>8.031</td>
<td>-.214</td>
<td>-4.053</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Advert</td>
<td>214.015</td>
<td>89.104</td>
<td>.153</td>
<td>2.402</td>
<td>.021</td>
</tr>
<tr>
<td></td>
<td>PriceC</td>
<td>37.851</td>
<td>8.150</td>
<td>.231</td>
<td>4.645</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Income</td>
<td>798.723</td>
<td>76.345</td>
<td>.689</td>
<td>10.462</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Pop</td>
<td>.253</td>
<td>.145</td>
<td>.095</td>
<td>1.748</td>
<td>.088</td>
</tr>
</tbody>
</table>

- Dependent Variable: Quantity

The followings symbols were used:

- Quantity = quantity of burger per month (units),
- Price = price of burger (Sen),
- PriceC = price of related product (Sen),
- Pop = local market population (number),
- Income = disposable income (RM'00), and
- Advert = expenditure on advertisement (RM'000).
Based on the results of the regression analysis, prepare the answers to the following questions to be shown to the production manager:

a. Determine the “goodness-of-fit” of the model. *(Hint: use the $R^2$ and $F$-test)*
   [5 marks]

b. Determine the significance of each independent variable at 95% level of confidence. *(Hint: use $t$-test)*
   [5 marks]

c. Provide an economic interpretation for each of the coefficients.
   [5 marks]

d. When $P = 600$; $Advert = 7.5$; $PriceC = 375$; $Income = 40.5$; and $Pop = 2500$, calculate the:
   i. price elasticity of demand;
   ii. income elasticity; and
   iii. cross-price elasticity.
   [5 marks]

e. For each of the elasticities above, provide as much information as you can with regard to the product to your production manager.
   [5 marks]

[TOTAL: 25 MARKS]
Question 3

The production function of cement with respect to its labour input is as follows:

<table>
<thead>
<tr>
<th>Output</th>
<th>Labour</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>29</td>
<td>3</td>
</tr>
<tr>
<td>44</td>
<td>4</td>
</tr>
<tr>
<td>55</td>
<td>5</td>
</tr>
<tr>
<td>60</td>
<td>6</td>
</tr>
<tr>
<td>62</td>
<td>7</td>
</tr>
<tr>
<td>62</td>
<td>8</td>
</tr>
<tr>
<td>60</td>
<td>9</td>
</tr>
<tr>
<td>53</td>
<td>10</td>
</tr>
</tbody>
</table>

Where

- \( Q \) = output (tonne)
- \( L \) = number of workers (number)
- \( L2 \) = square of the number of workers
- \( LQ \) = natural log of output
- \( LL \) = natural log of the number of workers

a. The estimated production functions in various functional forms are presented in Figure 2. Choose the “best” estimated equation that represents the relationship between the output and the number of workers. Explain your reasons.

[10 marks]

b. Suppose the output can be sold at RM10.00 per kg, based on the “best” estimated equation, how many workers should be employed if the daily wage rate is RM50.00?

[5 marks]

[TOTAL: 15 MARKS]
FIGURE 2

Linear functional form

Dependent Variable: Q
Method: Least Squares
Date: 03/29/06 Time: 23:14
Sample: 110
Included observations: 10

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>12.86667</td>
<td>7.812765</td>
<td>1.646878</td>
<td>0.1382</td>
</tr>
<tr>
<td>L</td>
<td>5.787879</td>
<td>1.259141</td>
<td>4.596688</td>
<td>0.0018</td>
</tr>
</tbody>
</table>

R-squared 0.725365 Mean dependent var 44.70000
Adjusted R-squared 0.691035 S.D. dependent var 20.57534
S.E. of regression 11.43672 Akaike info criterion 7.888391
Sum squared resid 1046.388 Schwarz criterion 7.948908
Log likelihood -37.44196 F-statistic 21.12954
Durbin-Watson stat 0.434289 Prob(F-statistic) 0.001763

Quadratic functional form

Dependent Variable: Q
Method: Least Squares
Date: 03/29/06 Time: 23:15
Sample: 110
Included observations: 10

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-17.38333</td>
<td>3.084309</td>
<td>-5.636054</td>
<td>0.0008</td>
</tr>
<tr>
<td>L</td>
<td>20.91288</td>
<td>1.288137</td>
<td>16.23497</td>
<td>0.0000</td>
</tr>
<tr>
<td>L²</td>
<td>-1.375000</td>
<td>0.114124</td>
<td>-12.04828</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-squared 0.987366 Mean dependent var 44.70000
Adjusted R-squared 0.983756 S.D. dependent var 20.57534
S.E. of regression 2.622373 Akaike info criterion 5.009361
Sum squared resid 48.13788 Schwarz criterion 5.100137
Log likelihood -22.04681 F-statistic 273.5240
Durbin-Watson stat 1.499552 Prob(F-statistic) 0.000000
Cobb-Douglas (Multiplicative ) functional form

Dependent Variable: LQ
Method: Least Squares
Date: 03/29/06   Time: 23:18
Sample: 1 10
Included observations: 10

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>2.107496</td>
<td>0.203538</td>
<td>10.35432</td>
<td>0.0000</td>
</tr>
<tr>
<td>LL</td>
<td>0.997156</td>
<td>0.122404</td>
<td>8.146430</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-squared        0.892422  Mean dependent var  3.613642
Adjusted R-squared 0.878974  S.D. dependent var  0.773742
S.E. of regression 0.269175  Akaike info criterion  0.389948
Sum squared resid  0.579642  Schwarz criterion    0.450465
Log likelihood    0.050259  F-statistic            66.36432
Durbin-Watson stat 0.437268  Prob(F-statistic)    0.000038
Question 4

Suppose there are 100 identical self-service petrol stations in the City of Malacca selling the same types of petrol. The total daily market demand function for petrol in the market is

\[ Q_D = 60,000 - 25,000P, \]

where \( P \) is expressed in RM per litre.

The daily market supply is

\[ Q_S = 25,000P \]

for \( P > \) RM0.60.

Answer the following:

a. Determine the equilibrium price and quantity of gasoline in the market. Please also illustrate the answer graphically.

[3 marks]

b. If a firm average variable cost function is \( AVC = 0.002Q \), what is the optimum level of output that will maximise the profit of the firm?

[3 marks]

c. Illustrate graphically the answer in (b).

[3 marks]

d. Suppose that now the market is monopolised (for example, a cartel is formed that determines the price and output as a monopolist would, and allocates production equally to each member), and the monopolist total cost function is:

\[ TC = 50,000 + 0.00001 Q^2 \]

What is the optimum level of output and price of the monopolist?

[3 marks]

e. Illustrate graphically the answer in (d).

[3 marks]

[TOTAL: 15 MARKS]
PART B
INSTRUCTIONS: 1. THERE ARE THREE (3) QUESTIONS IN THIS PART.
2. ANSWER TWO (2) ONLY.

Question 1

A firm experienced the demand as shown in the table below:

<table>
<thead>
<tr>
<th>Year</th>
<th>Demand</th>
<th>5 – year Moving Average</th>
<th>Exponential Smoothing (w = 0.9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>800</td>
<td>*****</td>
<td>*****</td>
</tr>
<tr>
<td>1991</td>
<td>925</td>
<td>*****</td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>900</td>
<td>*****</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>1025</td>
<td>*****</td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>1150</td>
<td>*****</td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>1160</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>1200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>1150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>1270</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>1290</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>*****</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Fill in the table by preparing forecasts based on a five-year moving average and exponential smoothing with w = 0.9.

[Note: The exponential smoothing forecasts may be begun by assuming \( \hat{Y}_{1+1} = Y_1 \).]

[7 marks]

b. Using the forecasts from 1995 through 1999, compare the accuracy of each of the forecasting methods based on the RMSE criterion. RMSE = \( \left\{ \sum (Y_t - \hat{Y}_t)^2 \right\}^{1/2} / n \).

[4 marks]
c. Which forecast would you have used for 2000? Why? [4 marks]

Question 2

a. “The perfectly competitive model is not very useful for managers because very few markets in the Malaysian economy are perfectly competitive.”

Do you agree with the above statement? Explain. Regardless of whether you agree or not, what lessons can managers learn by studying perfectly competitive markets? [7 marks]

b. Use the model of perfect competition to explain, illustrate, or elaborate on the following statements:

i. “Increasing competition from new firms entering the market is good because it means one is in good business.” [4 marks]

ii. “One important difference between an entrepreneur and a manager is that the former gets into a market before demand increases while the latter gets into the market after the shift.” [4 marks]

[TOTAL: 15 MARKS]
Question 3

Phillips Industries manufactures a certain product that can be sold directly to Retail Outlets or Superior Company for further processing and eventual sale by them as a completely different product. The demand function for each of these markets is:

Retail Outlets: \( P_1 = 60 - 2Q_1 \)
Superior Company: \( P_2 = 40 - Q_2 \)

where \( P_1 \) and \( P_2 \) are the prices charged and \( Q_1 \) and \( Q_2 \) are the quantities in the respective markets. Phillips’s total cost function for the manufacture of this product is:

\[ TC = 10 + 8(Q_1 + Q_2) \]

Please answer the following questions:

a. Determine Phillips’s total profit function.  

[3 marks]

b. What are the profit-maximising price and output levels for the product in the two markets?  

[4 marks]

c. At these levels of output, calculate the marginal revenue in each market.  

[4 marks]

d. What are Phillips’s total profits if the firm is effectively able to charge different prices in the two markets?  

[4 marks]

[TOTAL: 15 MARKS]