UNIVERSITY OF COLOMBO-SRI LANKA
FACULTY OF ARTS
FIRST YEAR EXAMINATION IN ARTS – 2017
(End of Second Semester)

FND 1216 – QUANTITATIVE METHODS FOR ECONOMICS

Answer FOUR (04) questions in total.
Question 01 in Section A is COMPULSORY. Select THREE questions from Section B.

Time: 2 Hours only.

SECTION A (40 MARKS)
COMPULSORY

Question No. 01 [40Marks]

1. Perform the indicated arithmetic operations
   a). $3X^2 + X^2 + X$
   b). $(3X^2) \times (3Y^2)$
   c). $\frac{4X^2}{2XY}$
   d). $(3X^2 + 2X^3 + Y) - (X^2 + X^3 - Y)$
   e). 0.5-(-0.45)-(0.01)
   f). (X<Y) 8
2. Solve each of the following linear equations
   a). 5X+3 = 15+3X
   b). $\frac{4X}{3} - 8 = X + 6$
   c). X+11X+24 =0
   d). X+4 = $\frac{4X}{3}$
   e). 2X+4 ≤ Y if X=10 what would be the minimum possible value of Y

3. Graph the following equations and indicate their slopes
   a). Qd = 200 - 5P
   b). $P = 20 + 0.2Qs$
   c). 4K+12L= 120

4. Find the values using logs (write down all steps)
   a). 1200^6 b). $\sqrt[3]{625}$ c). 8991 ÷ 1321 d). 1523 ×124

5. Solve the following simultaneous equations
   a). $\frac{4}{3}P = 100 - Q$
   $\frac{1}{4}P = Q$
   b). $600 = 3X + 0.5Y$
   52= 1.5Y-0.2X

SECTION B (60 MARKS)
ANSWER THREE QUESTIONS ONLY

Question No. 02 [20 Marks]

A competitive market has:

Inverse demand function $P_d = 60 - 0.1Q$ and

Inverse supply function $P_d = 0.05Q$

a. Find the equilibrium price and quantity. [5 Marks]

b. If the government imposes a per unit tax Rs.15.00 for the above goods what would be the new supply function? [5 Marks]

c. Find the new equilibrium price and quantity using graphical method. [5 Marks]

d. Calculate the total tax income government would earn through the taxation [5 Marks]

Question No. 03 [20 Marks]

Following information are given related to the two sector Keynesian macroeconomic model.

Equilibrium condition $\mathbf{Y = C + I}$

Consumption $\boldsymbol{C = a + bY}$

Investment $\boldsymbol{I = I_0}$

a. Find the equation for the equilibrium level of income in the reduced form. [5 Marks]

b. Find the investment multiplier. [5 Marks]

c. If value of **a = 175 , b = 0.25 , I = 25**
Find the value of equilibrium level of income and value of investment multiplier? [5 Marks]

d. Assume that government intervenes to the market by imposing lump sum tax (T) on income (Y) and government spends some income to buy goods and services (G).
How do you incorporate these changes into the above two sector Keynesian macroeconomic model? [5 Marks]

Question No. 04 [20 Marks]

a. Following which functions are homogeneous? If it is homogeneous determine the level of returns to scale?

1. $Q = AK^{.7}L^{.4}$ 2. $Q = 2K^{.5} + L^{.5} + KL$ 3. $Q = \frac{2K^2}{L}$ [10 Marks]

b. Assume firm face production function Q $= 10\,K^{0.5}L^{0.5}$ and plan to produce 100 units of goods. How many capital units firm needs to produce 100 units of goods if firm has already employed 20 labors? [5 Marks]

c. If firm double the current capital (K) inputs and labour (L) inputs what would be the new level of production? [5 Marks]

Question No. 05 [20 Marks]

A monopolistic firm practices price discrimination. Firm sells product at two different markets. Invers demand functions and total cost function are given below.

$$P_1 = 120 - 5Q_1$$
$$P_2 = 200 - 5Q_2$$
$$TC = 35 + 40Q \qquad (Q=Q_1 + Q_2)$$

a. If firm practices price discrimination what price will firm charge at each market? How many units of product sell at each market? [10 Marks]

b. If firm does not practices price discrimination what price will firm charge? And what would be the total revenue of the firm? [5 Marks]

c. Monopolist can earn higher profit by practicing price discrimination. Do you agree with this statement? Prue your answer with facts. [5 Marks]

Question No. 06 [20 Marks]

a. Assume that you plan to invest RS.200, 000 for one year period. COB bank pays 11% interest rate per annum for fix deposit. BNH bank pays 0.9 % interest rate per month for fix deposit. Which bank you prefer to invest your money? Give reasons for your preference. [10 Marks]

b. An investment project involves an initial cost Rs.600000 now and a return of RS.1, 000,000 in 5 years' time. If the interest rate is 9% what would be the net present value (NPV). Is it profitable to invest in this project? [10 Marks]

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