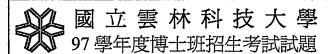


系所別:財務金融系 科 目:經濟學

There are four questions included in the exam. The first two questions are microeconomics and the latter two are macroeconomics. The weight points for each question are assigned.

- 1. Consider a profit-maximizing firm with the production function $y = f(x_1, x_2)$, facing output price p and factor prices w_1 and w_2 . Suppose this firm is taxed according to the total cost of factor 2, i.e., $tax = tw_2x_2$.
 - (a) Derive the factor demand functions. Are these choice functions homogeneous of any degree in any of the parameters? (7points)
 - (b) Show that if the tax rate rises, the firm will use less of factor 2. (6points)
 - (c) Show that $\partial x_1^* / \partial t = w_2 \partial x_2^* / \partial w_1$ (6points)
 - (d) Suppose that factor 1 is held fixed at its profit-maximizing level. Show that the response of factor 2 to a change in the tax rate is less in absolute value than before.

 (6points)
- 2. Find the production function associated with each of the following cost functions:
 - (a) $C = \sqrt{w_1 w_2} e^{y/2}$ (9points)
 - (b) $C = w_2[1 + y + \log(w_1/w_2)]$ (8points)
 - (c) $C = y(w_1^2 + w_2^2)^{1/2}$ (8points)
- 3. Suppose that planned expenditure is given by E = C(Y T) + I(r) + G, where E = expenditure, C(.) = consumption function, Y = GDP, T = tax revenues,
 - I(.) =investment function, r =interest rate, and G =government expenditure.
 - (a) Show how equal increases in G and T affect the position of IS curve. That is, what is the effect on Y for a given level of r? (Spoints)
 - (b) Show how equal increases in G and T affect the position of AD curve. That is, what is the effect on Y for a given level of inflation rate, π ? (9points) [Hints: Substitute LM curve $r = r(Y, \pi)$ into the IS curve to find the effect on Y]
 - (c) Suppose that tax revenues T, instead of being exogenous, are a function of GDP: T = T(Y), T'(Y) > 0. Show how an increase in T'(Y) affects the slope of the IS curve. (8points)



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- 4. Consider an individual who lives for two periods and has constant-absolute-risk-aversion utility, $U = -e^{-\gamma C_1} e^{-\gamma C_2}$, $\gamma > 0$. The interest rate is zero and the individual has no initial wealth, so the individual's life budget constraint is $C_1 + C_2 = Y_1 + Y_2$.
 - Y_1 is certain, but Y_2 is normally distributed with mean $\overline{Y_2}$ variance σ^2 .
 - (a) With an instantaneous utility function $U(C) = -e^{-\gamma C}$, $\gamma > 0$, what is the sign of U'''(C)?
 - (b) What is the individual's <u>expected</u> lifetime utility as a function of C_1 and the exogenous parameters Y_1 , $\overline{Y_2}$, σ^2 , and γ ? [Hints: If a variable x is normally distributed with mean μ and variance V, $E[e^x] = e^{\mu}e^{V/2}$] (9points)
 - (c) Find an expression for C_1 in terms of Y_1 , $\overline{Y_2}$, σ^2 , and γ . (8p oints)



國立雲林科技大學97學年度博士班招生考試試題

系所別:財務金融系

科 目:微積分

每題 10 分

- 1. Solve for $x: 5xe^{-x} + x^2e^{-x} = 0$.
- 2. Find y' and the slope of tangent line to the graph of $3e^x + e^{3y} = 4e^x + y$ at the point (0,0).
- 3. Find the particular solution for the differential equation $\frac{dy}{dx} = \sqrt{x}$; y(4) = 0.
- 4. Find the Taylor series of $\frac{1}{1+27r^3}$ at 0 and state the interval of convergence.
- 5. Find the value of $\int_{-\infty}^{\infty} f(x)dx$ if it converges.

$$f(x) = \begin{cases} 1 + x^3 & \text{if } 0 \le x \le 3\\ 0 & \text{otherwise} \end{cases}$$

6. Use the second derivative test to find the relative maxima and minima of the function

$$f(x) = 2x^3 + 3x^2 - 12x - 7$$

7. The probability density function for the duration of telephone calls in a certain city is

$$f(x) = \begin{cases} 0.5e^{-0.5x} & \text{if } x \ge 0 \\ 0 & \text{if } x < 0 \end{cases}$$
 Where x denotes the duration (in minutes) of a

randomly selected call. Find the probability that a randomly selected call will last between 2 and 3 minutes.

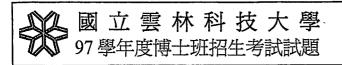
8. Find the sum of the series

$$\sum_{n=1}^{\infty} \frac{(-2)^n}{3^{n+1}}$$

9. Use a Taylor polynomial of degree 8 to approximate

$$\int_{0}^{1} e^{-x^{2}} dx$$

10. Two sides of a triangle are 4 inches long. What should the angle between these sides be to make the area of the triangle as large as possible?



系所別:財務金融系

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