# NANYANG TECHNOLOGICAL UNIVERSITY

## MIDTERM QUIZ

## HE1001 MICROECONOMICS I

**I. Multiple Choice Questions (2 marks*14=28 marks)**

1. _____ teaches HE1001 lectures?
   A. Dr. Wang Wei Siang
   B. Dr. He Tai-Sen
   C. Dr. Sng Hui Ying

2. HE1001 **tutorials** are held at _____.
   A. North Spine
   B. The Hive
   C. South Spine
   D. SHHK Building

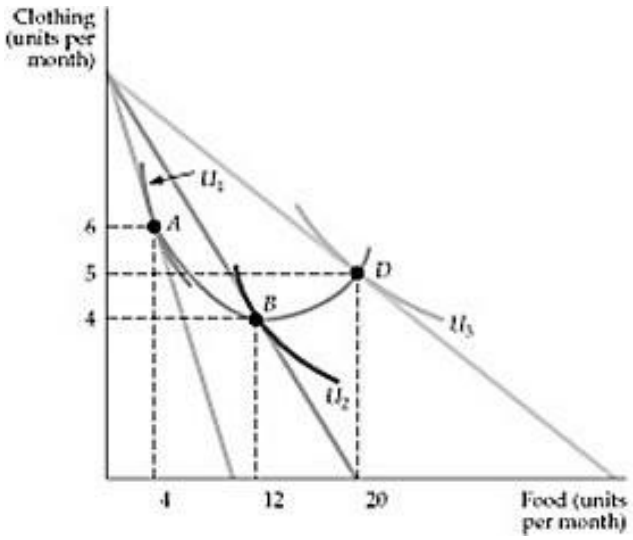
3. Molly loves hamburgers and soft drinks but insists on consuming exactly one soft drink for every hamburger she eats. Her utility function can be expressed as _____, where D represents the number of soft drinks and H represents the number of hamburgers she consumes.
   A. u(D, H) = D+H
   B. u(D, H) = min (D, H)
   C. u(D, H) = 2D +H
   D. u(D, H) = max (D, H)

4. The cross-price elasticity of demand for peanut butter with respect to the price of jelly is -0.3. If the price of jelly declines by 15%, what is the expected change in the quantity demanded for peanut butter?
   A. + 15%
   B. + 45%
   C. + 4.5%
   D. - 4.5%

5. A curve that represents all combinations of consumption bundles that provide the same level of utility to a consumer is called:
   A. an indifference curve.
   B. a budget line.
   C. a demand curve showing the relationship between income and quantity supplied
   D. a utility function.

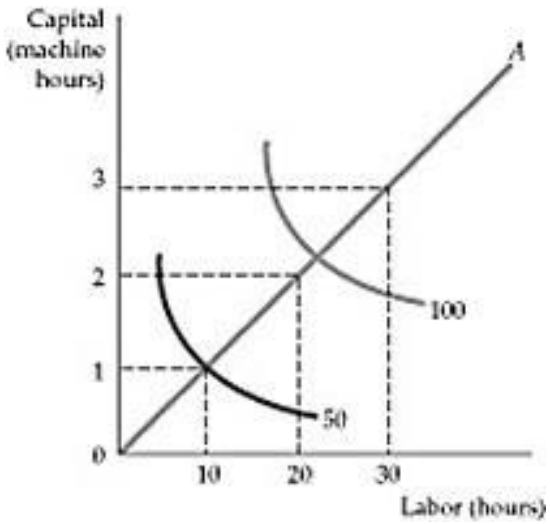
6. Which one of the following production functions exhibits **decreasing** return to scale?
   A. Q=L+K
   B. $Q=L^{0.6}K^{0.6}$
   C. $Q=L^{0.5}K^{0.5}$
   D. $Q=L^{0.4}$
   E. None of the above

7. Refer to the figure below. In the **upward-sloping** portion of the price-consumption curve that connects points *A*, *B* and *D*, the two goods, food and clothing, are:




A. substitutes.
B. complements.
C. independent.
D. Cannot be determined from the information provided.

8. Refer to the figure below. The curves represent isoquants of a production function for output levels 50 and 100. The production function exhibits _____.




A. constant returns to scale.
B. decreasing returns to scale.
C. increasing returns to scale.

9. In the lecture on Behavioural Economics, we played a game called "*Choosing a Marriage Partner*." The purpose of the game is to test whether people's choices align with which assumption in standard economic theory?
   A. Completeness
   B. Non-satiation
   C. Transitivity
   D. Self-interest

10. When the average product is **increasing**, marginal product:
   A. exceeds average product.
   B. is decreasing.
   C. is less than average product.
   D. may be greater or less than average product.

11. Sugar can be refined from sugar beets. When the price of those beets **rises**,
   A. the supply curve for sugar would shift right.
   B. the supply curve for sugar would shift left.
   C. the demand curve for sugar would shift right.
   D. the quantity supplied of sugar would increase.

12. An Engel curve is backward-bending (slopes upward at first and then downward) when:
   A. the good is inferior after a certain level of income.
   B. the good is inferior at low levels of income.
   C. the good is inferior for all levels of income.
   D. the good is normal above a certain level of income.

13. By 2030, analysts expect that demand for electric cars will increase as buyers become more familiar with the technology. However, the costs of producing electric cars may increase because of higher costs for inputs (e.g., rare earth elements). What is the expected impact of these changes on the equilibrium price and quantity for electric cars?
   A. Unambiguously higher equilibrium price and quantity
   B. Unambiguously higher price, and equilibrium quantity may be higher or lower
   C. Unambiguously higher quantity, and equilibrium price may be higher or lower
   D. We cannot form any unambiguous expectations for either price or quantity.

14. If indifference curves cross, then:
   A. the assumption of a diminishing marginal rate of substitution is violated.
   B. the assumption of transitivity is violated.
   C. the assumption of completeness is violated.
   D. consumers minimize their utility.

**II. Fill-in-the-blank Questions with Justification (8 marks)**

1. (4 marks) Suppose the demand curve for bubble tea is given by $Q^D = 300 - 2P + 4A$, where P is the price of the product, and A is average income measured in thousands of dollars. Suppose average income A = 25 (in thousands of dollars). If the price of bubble tea increases from 4 to 6, the **arc price elasticity of demand** is _____.

   Justification:

   **Step 1. Demand equation**
   $Q^D = 300 - 2P + 4A$
   Given A = 25 (in thousands of dollars):
   $Q^D = 300 - 2P + 4(25) = 300 - 2P + 100 = 400 - 2P$

   **Step 2. Compute quantities at each price**
   When $P_1 = 4$: $Q_1 = 400 - 2(4) = 392$
   When $P_2 = 6$: $Q_2 = 400 - 2(6) = 388$

   **Step 3. Arc elasticity formula**
   $E\_arc = [(Q_2 - Q_1) / ((Q_1 + Q_2)/2)] \div [(P_2 - P_1) / ((P_1 + P_2)/2)]$
   $= [(388 - 392) / ((392 + 388)/2)] \div [(6 - 4) / ((6 + 4)/2)]$
   $= -0.0256$

   The arc price elasticity of demand is –0.0256, indicating that demand is highly inelastic — quantity changes very little relative to price changes.

2. (4 marks) Both Jane and John consume two goods, X and Y. Jane has a utility function of $U=4X^{0.5}Y^{0.5}$ while John has a utility function of $U=X^{0.4}Y^{0.4}$. The current prices of X and Y are $P_X=25$ and $P_Y=50$, respectively. Jane currently has an income of 750 and John has an income of 500. Assume the market consists only of Jane and John. **The market demand function for good Y (in terms of $P_Y$)** is _____.

   Justification:

   **Step 1: Derive the individual demand for good Y**

   Using the first-order condition and budget condition to derive the individual demand for good Y

   $Y_{Jane}=375/P_Y$

   $Y_{John}=250/P_Y$

   **Step 2: Derive the market demand for good Y**

   Market demand for good Y: $Y_{Market}= 375/P_Y + 250/P_Y = 625/P_Y$

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