Indicate whether you consider each of the following statements to be TRUE or FALSE.　In each case give a brief explanation of your answer.　**Your grade will depend heavily on your explanation.** (8 points for questions 1-5; 10 points for question 6)

1. Mr. Wang spends his money income on two goods x and y.　If his preferences for the two goods can be represented by a homothetic utility function, then his income elasticity of x and that of y are both equal to one.

2. While an individual's labor supply curve may be backward-bending, it is impossible for a person to choose to work so much less that her total labor earnings decline at a higher wage.

3. If x = f(K, L) is a constant returns to scale production function satisfying the law of diminishing marginal product with respect to labor, then the marginal product of capital must also diminish as more capital is used in the process of production.

4. Let c(x) be a firm's long run cost function, and define the cost elasticity with respect to output as $e = \dfrac{dc}{dx}\dfrac{x}{c}$.　Then, there is (internal) economies of scale if $e > 1$.

5. Gukeng (古坑) has a competitive coffee industry with the supply function $p_x = 400 + x$.　While the market demand for coffee is $p_x = 600 - x$, there are "external benefits" that the citizens of Gukeng derive from having a coffee odor wafting through the town. The marginal external benefit schedule is $MEB = 40 - x$.　As such, the local government should subsidize the industry in order to produce the socially optimal amount of coffee.

6. There are three measures for a consumer's welfare when the price of a good she consumes changes, namely, compensating variation (CV), equivalent variation (EV) and change in consumer surplus (ΔCS).　A consumer with money income m=100 consumes only one good x and has utility function $u(x) = \sqrt{x}$.　If the price of x first increases from 1 to 4, and then decreases back to 1.　Then, the consumer gains from the price changes according to CV, loses according to EV, and no change in welfare according to ΔCS.

Q1. Can you explain the definitions for the following concepts: (i) A game with perfect information; (ii) A game with complete information; (iii) A strictly dominated strategy; (iv) Never a best response; (v) Pareto optimum? **[25 points]**

Q2. Consider the following Edgeworth box economy.

$$u^A(x_1^A, x_2^A) = \left(\sqrt{x_1^A} + 2\sqrt{x_2^A}\right)^2,$$

$$u^B(x_1^B, x_2^B) = \left(\sqrt{x_1^B} + 2\sqrt{x_2^B}\right)^2,$$

where the endowments for A and B are $e^A = (e_1^A, e_2^A) = (4, 1)$ and $e^B = (1, 4)$.

(i) Find the set of Pareto optimal allocations and draw it in an Edgeworth box together with the endowment point.

(ii) Find a competitive equilibrium with the price of good 1 normalized as 1. **[25 points]**