**NRU HSE-2020, Microeconomics Class-06**

# Production

**1.** Suppose that for any output level Q the isoquant can be written as . Analyze each of the following statements:

(a) This firm may produce output with labour only

(b) Marginal product of labour is negative

(c) This technology has diminishing marginal return to K

(d) This technology has increasing marginal return to L

(e) This technology has increasing returns to scale

**2.** Consider a firm that currently operates at point A and produces 10 units of output using 8 units of labour and 6 units of capital. This firm has diminishing MRTS. Its current MPL equals 3 and MPK equals 2. Assume that w=1 and current total cost is 20. All factors are variable and infinitely divisible.

**(a)** Write down an equation for isocost that goes through point A.

**(b)** Illustrate isoquant and isocost that go through point A. Explain in words how the same output could be produced with lower cost.

**(c)** Illustrate graphically point B that provides the same output as A with lower cost but is not a cost minimizing bundle. At your graph indicate the achieved cost economy ΔC.

**3.** Tricycles must be produced with 3 wheels and 1 frame for each tricycle. Let *Q* be the number of tricycles, *W* be the number of wheels, and *F* be the number of frames. The price of a wheel is *PW* and the price of a frame is *PF*.

**(a)** What is the production function for tricycles, *Q*(*F, W*)?

**(b)** What is the long-run total cost function for producing tricycles, *TC*(*Q, PW, PF*)?

**(c)** Derive and sketch the long run MC and AC curves. Explain the shape.