**TUTORIAL 8**

**PRODUCTION**

1. Neptune Enterprises has a certain production process which employs two inputs labors(L) and raw material(R).Output is a function of these inputs and is given by: Q=6L2 R2 -0.1L3R3

Assume that raw material is fixed at 10 units. Determine the boundaries of labor for these stages of production**.(1ST stage (0-3),2nd (3-4),3rd stage4 onwards)**

1. The Royal Furnishing manufacturer’s office furniture with the following production function: Q=20K0.1L0.9.The firm currently is producing with maximum efficiency and using 20 units of capital and 50 units of labour.
2. .What is the rate of output?
3. What will be the price of Labour if the rate of capital is 50?(**Q=906.1)**

**Pl=180)**

1. Given the two factor production function: Q=150L0.5K0.5,wage rate of labor=Rs 50 and rental cost of capital =Rs 40.Determine amounts of labour and capital that will minimize the cost of producing 1118 units of output. **(L= 6.6 and K=8.3)**
2. As part of the restructuring plan Mitsubishi conducts an analysis of how labour and capital are used in its production process. Prior to restructuring, the company’s Marginal rate of technical substitution was 0.15.To hire workers suppose that Mitsubishi must pay the competitive hourly wage of $1330 and determines that its marginal productivity of capital is 0.5 small cars per hour at its new targeted level of output. Their analysis also indicates that average selling price of the car is @9.5 lakhs. Determine the rate at which Mitsubishi can rent capital and the marginal productivity of labour at its new targeted level of output. To minimize cost, what should be the value of MRTS**.(.0028)**
3. You manage a plant that mass produces engines by teams of workers using assembly machines. The technology is summarized by the production function Q=5KL, where Q=number of engines per week, K = number of assembly machines and L=number of labour teams. Each assembly machine rents for r=$10,000 per week and each team cost w= $ 5,000 per week. Engine costs are given by the costs of labour teams and machines, plus $2000 per engine for raw materials. Your plant has a fixed installation of 5 assembly machines as part of its design. What is the isocost line for your plant? You are asked to make long run recommendations for the design of a new production facility. What would be the optimum input combination to produce 10,000 engines per week?(**K=31.622 , L= 63.24)**