Economics for Engineers

Department of Humanities
VSSUT Burla

Long-Run Production

- All Factors are variables
- Use of Isoquants or equal product curve
- Isoquant: Locus of the different combinations of two factor inputs producing same level of output
- Marginal Rate of Technical Substitutions (MRTS): The slope of Isoquant
- MRS=MUx/MUy
- MRTS=MPL/MPK
- MPL=dq/dl..=dq/dk

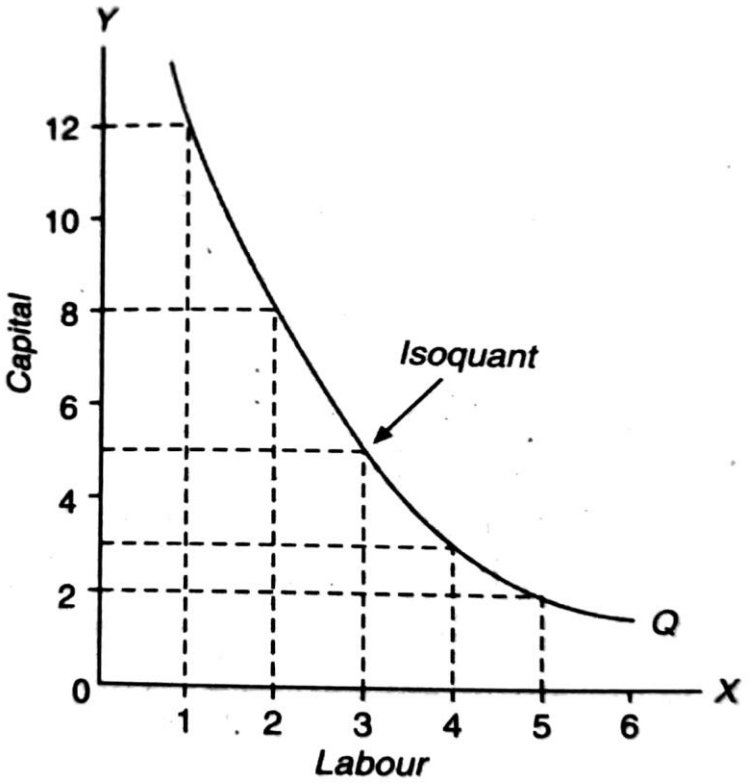
- U=F(X,Y).....IC
- I=PX.X+PY.Y....Budget Line
- SLOPE OF IC= SLOPE OF BL
- MUX/MUY=PX/PY……CONSUMER EQUL

- Q=F(L,K)… IQ
- C=WL+RK…ISO COST LINE
- SLOPE OF IQ= SLOPE OF Iso COST
- MPL/MPK=W/R

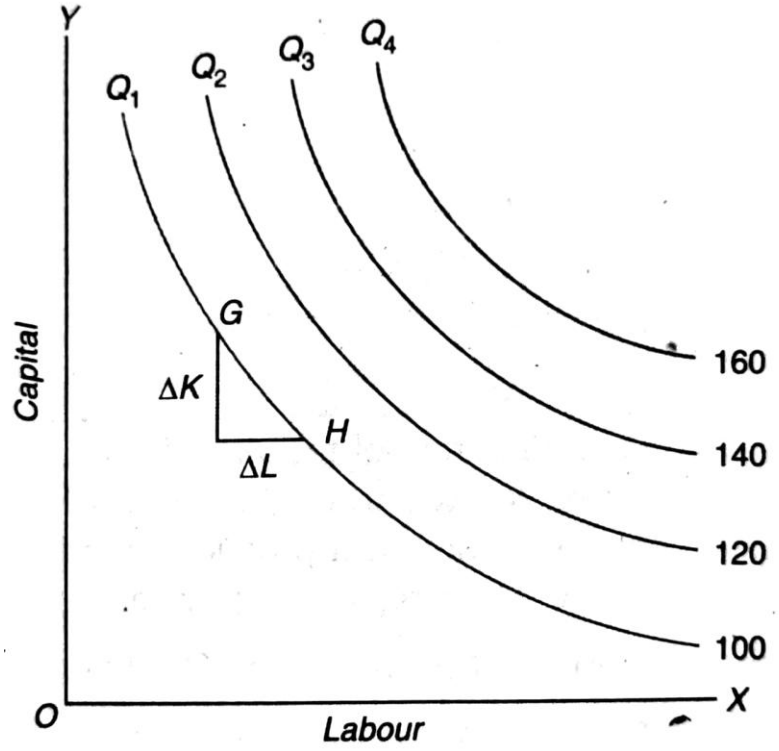
Contd… u= f(x,y)...IC

Q=F(L,K)....

Isoquant



Isoquant Map



Properties of Isoquants

1. Isoquants slope downward to the right
2. Isoquants are convex to the origin
3. Never intersect each other
4. Higher Isoquants represents higher level of output

Return to Scale

- ✓ Scaling Up or Scaling Down
- ✓ Looking into Output by changing all input in the same proportion

$$Q=f(L.\ K)$$

$$hQ=f(\$LK)$$

Now, If h=$: Output increases in same proportion to input (Constant return to Scale)

Contd…

If h>$: Output increases more than proportionately to input changes(Increasing return to Scale)

If h<$: Output increases less than proportionately to input changes (Decreasing return to Scale)

Cobb-Douglas Production function:

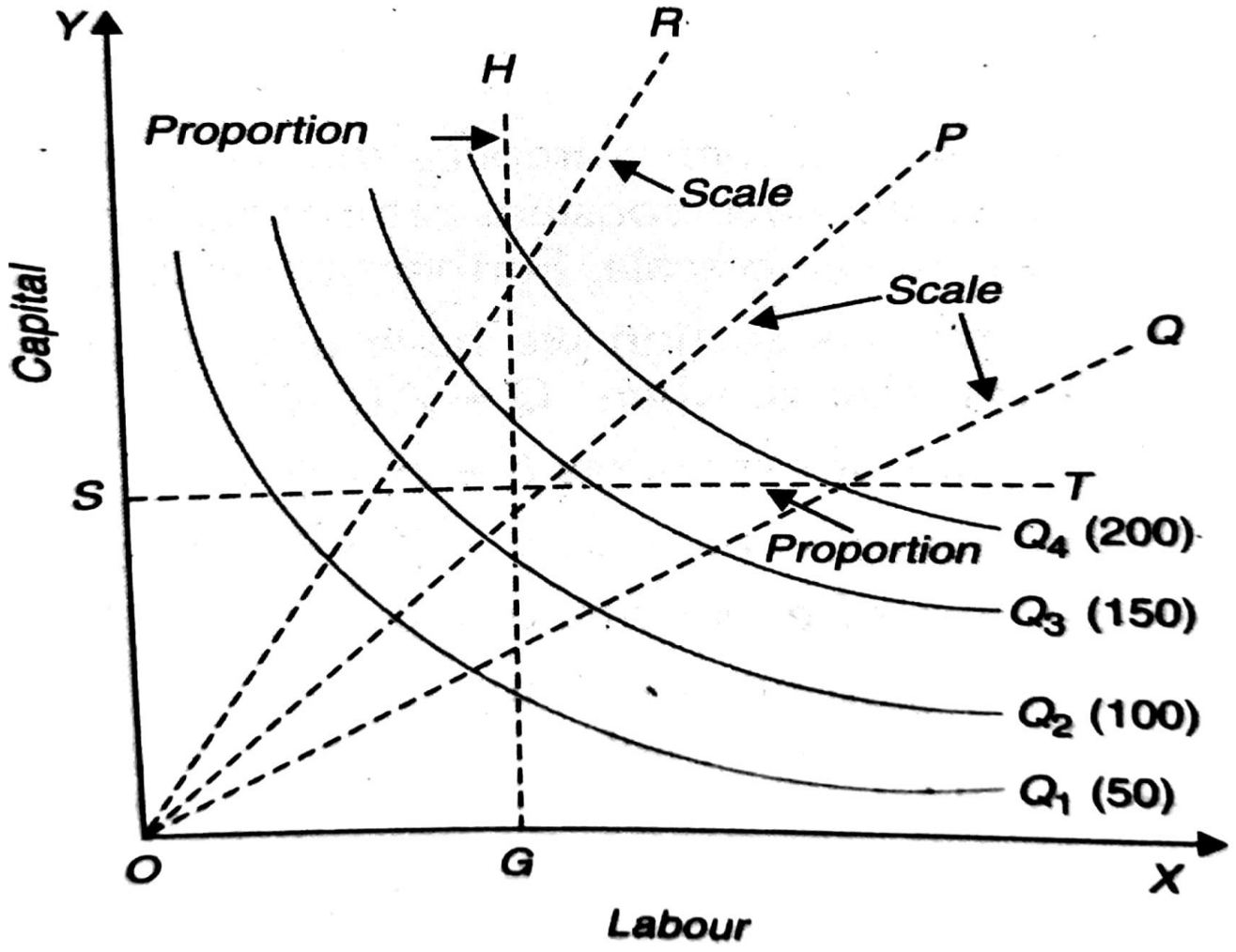
$$Q = AL^{\alpha}K^{\beta}$$

$$\alpha + \beta = 1 \ (CRS)$$

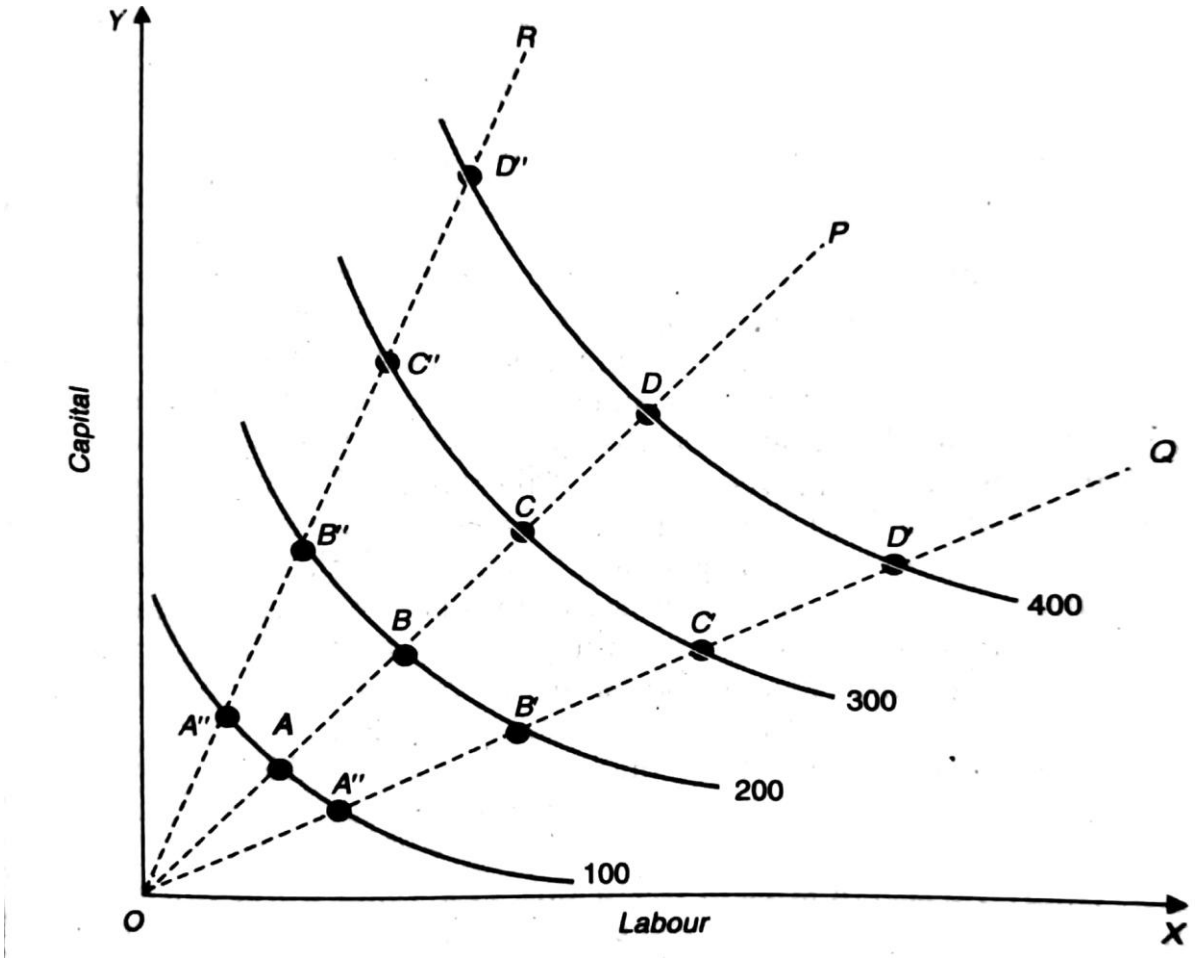
$$\alpha + \beta < 1 \ (DRS)$$

$$\alpha + \beta > 1 \ (IRS)$$

Change in Scale and Factor Proportion

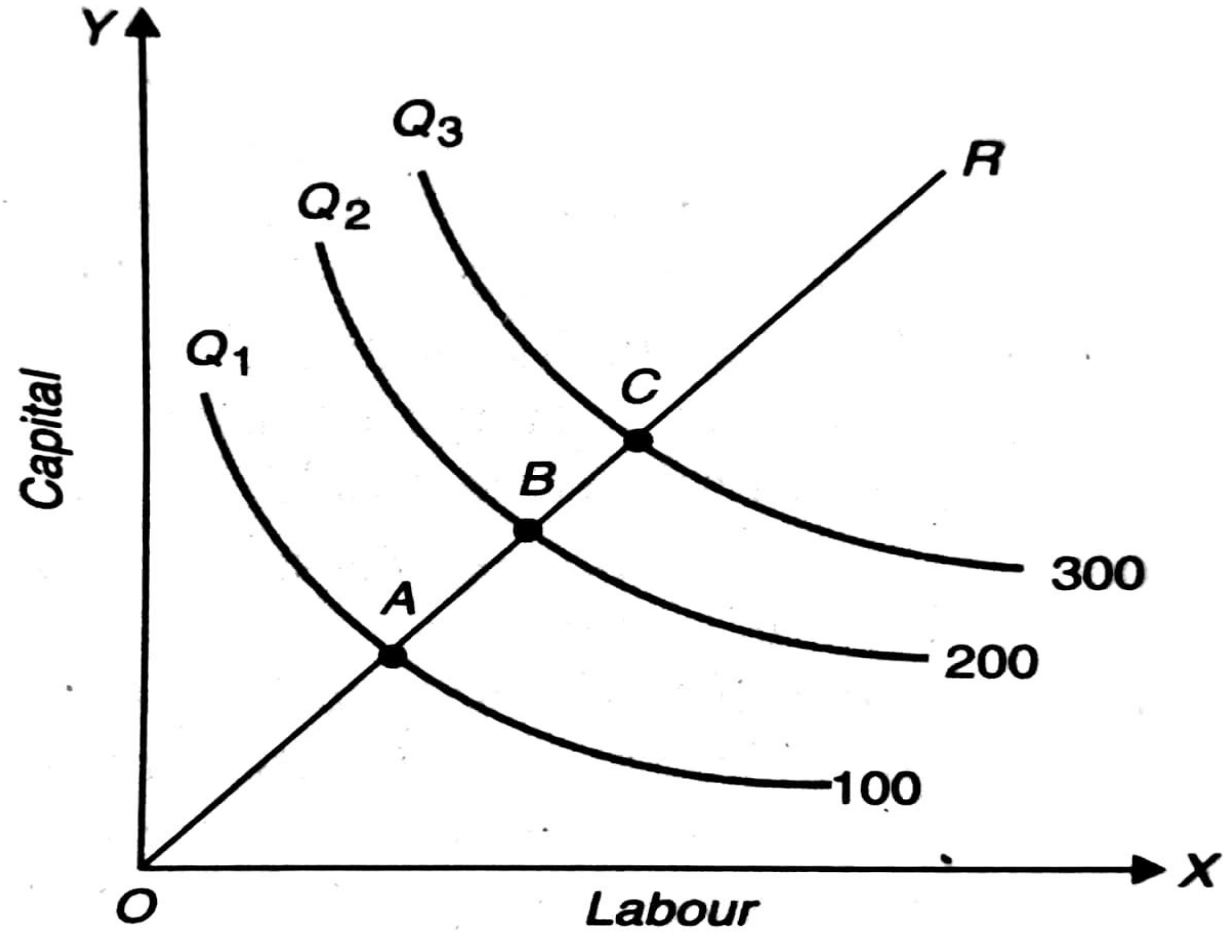


Constant Return to Scale



Increasing Return to Scale... OA> AB>BC

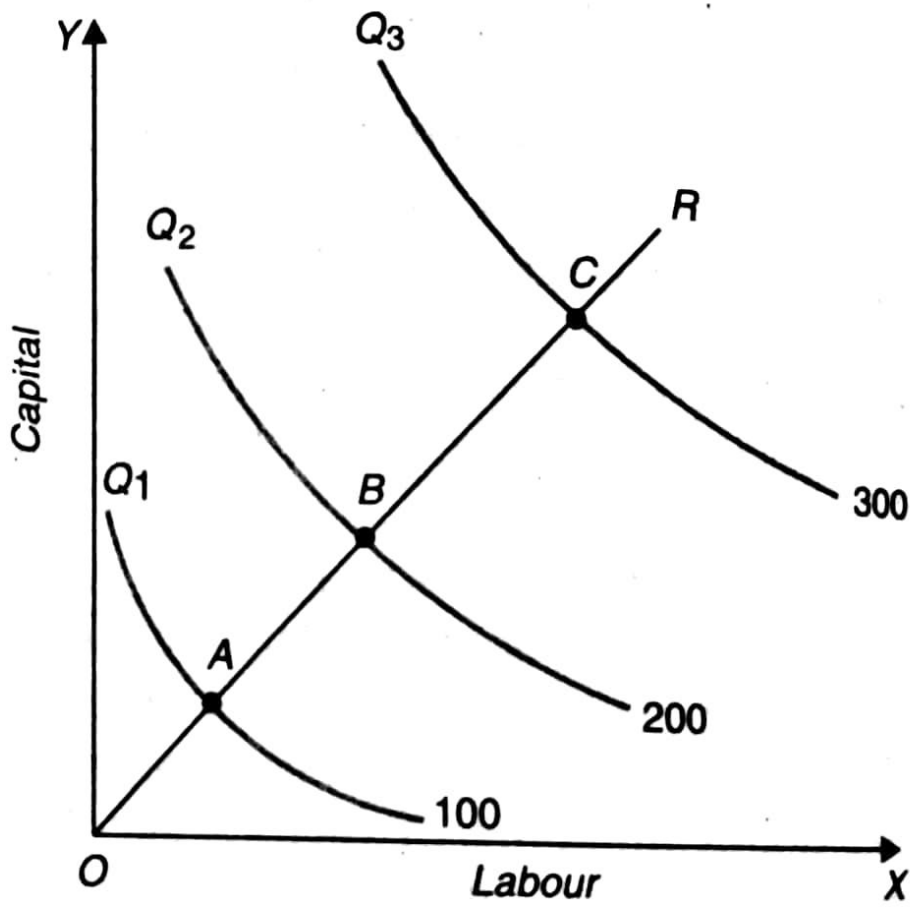
OA<AB<BC... OA=AB=BC



Contd…

- Indivisibility of the factors
- Greater possibility of specialisation
- Dimensional Economies

Decreasing Return to Scale OA<AB<BC



$$TC=TFC+TVC\ldots$$

$$TAC=TC/Q$$

$$AFC=TFC/Q$$

$$AVC=TVC/Q$$

$$TAC=AFC+AVC$$

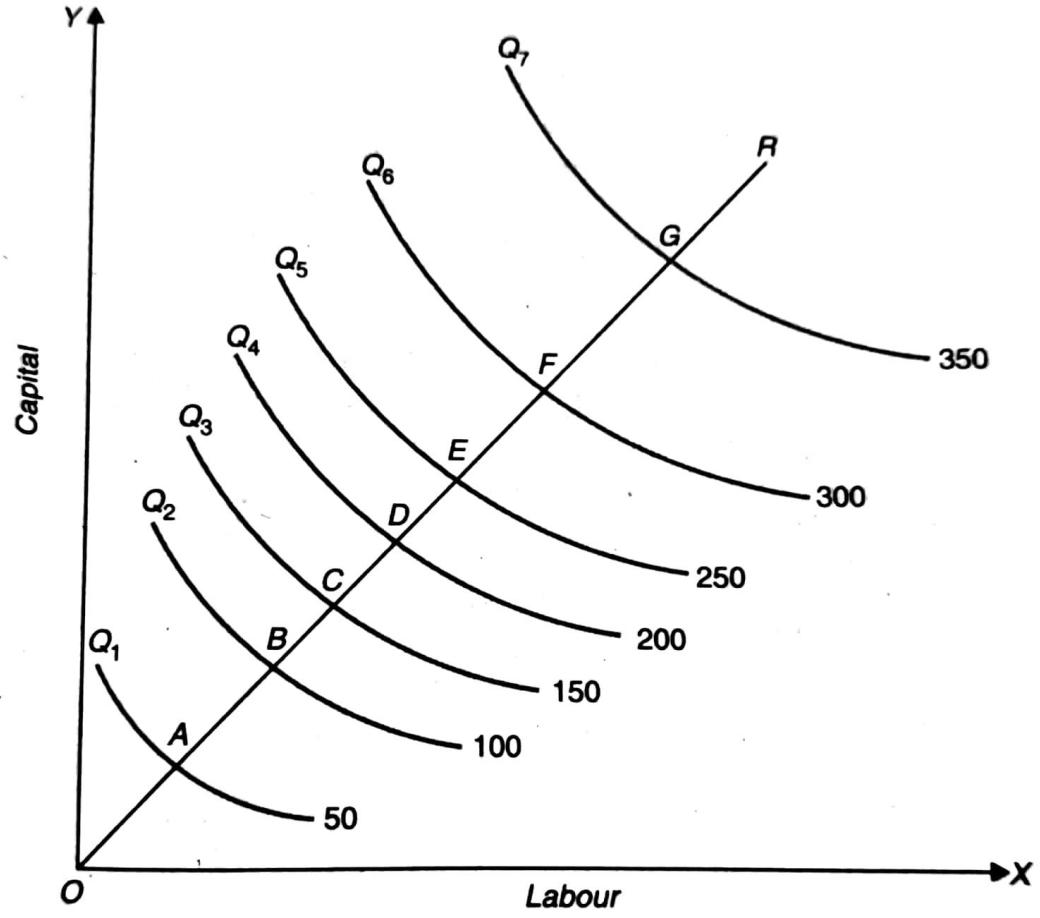
$$MC$$

$$TC=TVC$$

$$TAC=AVC$$

$$MC$$

Varying Return to Scale




Thank
you!!