Section 13
FAQ

1 Given that WIR = k. $R^{0.5}$ and C=M+N.R where WIR=weft insertion rate in m/min, R=reed width in meters, C= loom cost and M & N are two constants find out the condition under which it would be more profitable (in terms of cost of investment per square meter of fabric produced) to purchase one loom of width 2R as compared to two looms each of width R.

Ans. Let both looms weave fabrics of P picks/m from same warp and weft.
Let the loom of width R m operate at n rpm such that n. R=WIR= k. $R^{0.5}$
Hence n = k. $R^{-0.5}$
Accordingly the loom of width 2R would operate at rpm = k. $(2R)^{-0.5}$= 0.71n
The WIR of loom of width 2R would therefore be 1.41 n. R= 1.41 times WIR of loom of width R
It follows that area of fabric produced by loom of width 2R would be 1.41Z while that produced by one loom of width R would be Z in the same time period.
Cost of a loom of width R = (M+N. R) while the cost of one loom of width 2R is (M+2N.R)
Hence cost of loom per square meter of fabric produced by loom of width R= (M+N. R)/Z while that for loom of width 2R would be (M+2 N. R)/1.41Z
The condition under which it would be more profitable to procure a loom of width 2R would be (M+ N. R) > 0.71 (M+2 N. R) which leads to the condition that R<0.71M/N