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QMM-64018-003

Assignment module-2 - The LP Model

Q1 Total Nylon sheet in Sq.ft = 5000
Total working time in min = 84000

(a) Decision variables :- Collegiate(x)
Mini(y)

(b) Objective function :- for profit maximization

$Z_{max} = 32x + 24y$

(c) constraints :- $x \geq 1000$ $y \geq 1200$

(d.) Mathematical formulation :- $3x + 2y \leq 5000$

$45x + 40y \leq 84000$

$x, y \geq 0$

Q2 (a) Decision variables :- Lx, Mx, Sx
different plants are x and different sizes are Large(L), medium(M), small(S)

(b) Linear programming model :-

(i) decision variables :→ Lx, Mx, Sx

(ii) objective function :→

$Z_{max} = 420(L_1+L_2+L_3) + 360(m_1+m_2+m_3) + 300(S_1+S_2+S_3)$ which is our daily profit

$= 420L_1 + 420L_2 + 420L_3 + 360m_1 + 360m_2 + 360m_3 + 300S_1 + 300S_2 + 300S_3$

(iii) constraints :→ $L_1 + m_1 + S_1 \leq 750$ (plant 1 Spare capacity)

$L_2 + m_2 + S_2 \leq 900$ (for plant 2 Spare capacity)

$L3 + m3 + S3 \leq 450$ (Plant 3 Spare capacity)

$L1 + L2 + L3 \leq 900$ (large sales forecast) ..

$m1 + m2 + m3 \leq 1200$ (medium sales forecast)

$S1 + S2 + S3 \leq 750$ (Small sales forecast)

$20L1 + 15m1 + 12S1 \leq 13000$ (plant 1 Storage space)

$20L2 + 15m2 + 12S2 \leq 12000$ (plant 2 Storage space)

$20L3 + 15m3 + 12S3 \leq 5000$ (plant 3 Storage space)

$Lx, Mx, Sx \geq 0$