SOLUTIONS TO QUIZ 2

K – E – B – A – Ü – K (2594 km)   16 pts

B – E – K – Ü – A – B (2594 km)   16 pts

Ü – A – B – E – K – Ü (2594 km)   16 pts

E – K – B – A – Ü – E (2767 km)   16 pts

A – Ü – K – E – B – A (2594 km)   16 pts

The round-trip route determined by the NNH is

      Kadıköy -> Erdek -> Bodrum -> Alanya -> Ürgüp -> Kadıköy

      OR Kadıköy -> Ürgüp -> Alanya -> Bodrum -> Erdek -> Kadıköy

In either case, the total distance traveled is 2594 km   20 pts

Player Value-to-Cost Ratios: $R_1=15$, $R_2=40/4=10$, $R_3=22/2=11$, $R_4=24/2=12$, $R_5=10/0.8=12.5$

Player Selection Priorities (based on ratios): 1 – 5 – 4 – 3 – 2   10 pts.

LR sol'n: $x_1 = x_5 = x_4 = x_3 = 1$, $x_2 = 0.3$; $z = 83$ 20 pts.

P1 (LR + $x_2 = 0$): $x_2 = 0$; $x_1 = x_5 = x_4 = x_3 = 1$; $z = 71$ (Candidate)   10 pts.

P2 (LR + $x_2 = 1$): $x_2 = 1$; $x_1 = x_5 = 1$, $x_4 = 0.6$, $x_3 = 0$; $z = 79.4$ 10 pts.

P3 (P2 + $x_4 = 0$): $x_2 = 1$, $x_4 = 0$; $x_1 = x_5 = 1$, $x_3 = 0.6$; $z = 78.2$ 10 pts.

P4 (P2 + $x_4 = 1$): $x_2 = 1$, $x_4 = 1$; $x_1 = 1$, $x_5 = x_3 = 0$; $z = 79$ (New Candidate)   10 pts.

The solution from P3 is fractional, and its objective function value ($z=78.2$) is not better than the current candidate solution's value ($z=79$). Therefore, the solution found at P4 is optimal: $x_1 = x_2 = x_4 = 1$, $x_3 = x_5 = 0$; $z = 79$ 10 pts.

The optimal group of players to sign is Arturs Zagars, Scottie Wilbekin, and Khem Birch. This combination provides the maximum possible team value of 79 while staying exactly within the $7 million budget.   20 pts.