

Q45

\* Dead Load:

$$W_{DL} = \underset{\text{Steel}}{0.5} + RC + \text{Ballast} + \text{track}$$

$$= 2.5 + (2.5 \times 0.25 \times 5) + (1.8 \times 0.2 \times 5) + 0.6 = 8.025 \text{ t/m}$$

$$M_{max_{DL}} = \frac{8.025 \times 40^2}{8} = 1605 \text{ t.m}$$

$$Q_{max_{DL}} = \frac{8.025 \times 40}{2} = 160.5 \text{ t.}$$

\* Live Loads:

$$\phi = 0.73 + \frac{2.16}{LI - 0.2}$$

$$LI = \text{Span of MG} \times \# \text{ tracks} = 40 \times 2 = 80 \text{ m.}$$

$$\therefore \phi = 0.73 + \frac{2.16}{80 - 0.2} = 0.98 < 1$$

$\therefore$  take  $I_{\text{red}} = 0.1$

$$R = \left[ 8 \times 17.2^2 + 25 \times (18 + 19.6 + 21.2 + 22.8) + 8 \times 16.4 \times 31.8 \right] / 40 = 184.9 \text{ t.}$$

$$M_{u_{max}} = 184.9 \times (20.4)$$

$$- 8 \times 16.4 \times (20 - \frac{16.4}{2} + 0.4)$$

$$- 25 \times (3.2 + 1.6) + \frac{1 \times 40^2}{8} = 2251.3 \text{ t.m}$$

$$Q_{u_{max}} = \left[ \frac{8 \times 34.4^2}{2} + 25 \times (35.2 + 36.8 + 38.4 + 40) \right] / 40$$

$$+ \frac{40 \times 1}{2} = 232.3 \text{ t.}$$

$$M_T = 1605 + 2251.3 \times 1.1 = 4081.4 \text{ t.m}$$

$$Q_T = 160.5 + 232.3 \times 1.1 = 416.03 \text{ t.}$$

