

Practice Problem Set 2: Engineering Mechanics (NMEC101)

Answers

1. (a) Magnitude of reaction at each of the front wheels (H) = 34.04 kN
(b) Magnitude of reaction at each of the rear wheels (K) = 4.96 kN

2. (a) Magnitude of vertical force P = 29.8 N
(b) Magnitude of reaction at each of the two wheels 145.1 N

3. (a) $a = 0$
(b) Magnitude of reaction at A = 10.67 N
Magnitude of reaction at B = 14.73 N

4. (a) $1.5 \text{ kN} < Q < 90 \text{ kN}$

5. (a) $78.9 \text{ kg} < m < 162.2 \text{ kg}$

6. (a) The force exerted on the roller at A is 16 N
(b) Reaction force at C is $(-16\hat{i} - 1.85\hat{j}) \text{ N}$

7. Tension in cable BCD is 65.76 N.
Reaction at support A is $(11.9\hat{i} - 74.15\hat{j}) \text{ N}$

8. (a) $\theta = 26.5^\circ$
(b) Magnitude of reaction at B and C = 1.117 P

9. (a) The magnitude of tension in the cord $OB = 4.243 \text{ lb}$
(b) Magnitude of reaction at A and A = 5.795 lb

10. $A = D = 0$, $B = 868 \hat{i}$, and $C = -126.1 \hat{i}$

11. $C_X = 32 \text{ N}$, $C_Y = 16 \text{ N}$, and $M_C = 1643.2 \text{ N-cm}$

12. (a) $\sin \theta = \frac{kl}{\sqrt{2}(kl-P)}$
(b) $\theta = 141.05^\circ$