✅ Answer Key

1. **Q1 Calculation:**
   Radius = 8 m
   $$\text{Safe Load} = 25{,}000 - (1{,}500 \times (8 - 5))$$
   $$\text{Safe Load} = 25{,}000 - (1{,}500 \times 3)$$
   $$\text{Safe Load} = 25{,}000 - 4{,}500 = 20{,}500 \text{ kg}$$
   Answer: 20,500 kg

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2. **Q2 Calculation:**
   Radius = 10 m
   $$\text{Safe Load} = 25{,}000 - (1{,}500 \times (10 - 5))$$
   $$\text{Safe Load} = 25{,}000 - (1{,}500 \times 5)$$
   $$\text{Safe Load} = 25{,}000 - 7{,}500 = 17{,}500 \text{ kg}$$
   Beam weight = 12,000 kg
   Is it safe? Yes, because 12,000 kg < 17,500 kg.

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3. **Q3 Calculation:**
   Safe Load = 20,000 kg
   $$20{,}000 = 25{,}000 - (1{,}500 \times (\text{Radius} - 5))$$
   Rearrange:
   $$1{,}500 \times (\text{Radius} - 5) = 25{,}000 - 20{,}000$$
   $$1{,}500 \times (\text{Radius} - 5) = 5{,}000$$
   $$\text{Radius} - 5 = \frac{5{,}000}{1{,}500} \approx 3.33$$
   $$\text{Radius} = 5 + 3.33 = 8.33 \text{ m}$$
   Answer: Maximum radius ≈ **8.3 meters**