Q 1: Determine the tension in cables (AB, BC, and CD) necessary to support the traffic lights at (B) and (C). Also, find the angle (θ).

Given that:
The mass of the traffic light at (B) is (10 kg).
The mass of the traffic light at (C) is (15 kg).

Solution:
Q 2: Two forces (F₁ and F₂) act on the hook shown in figure. Determine the magnitude of the force (F₂) and its coordinate direction angles. Given that the resultant force (Fₚ) acts along the positive y-axis and has a magnitude of (800 N).

Solution:
Q 3: Replace the loading system shown in figure by an equivalent resultant force and couple moment, and specify where the resultant’s line of action intersects the member (AB) measured from (A).

Solution:
Q 4: For the beam shown in figure, determine the reactions at the supports (A) and (B). Neglect the weight and thickness of the beam.

NOTE:
A – Hinge (pin) and B – Roller.

Solution:
Q 5: Determine the force in members (ED, EH, and GH) of the truss shown in figure, and state if the members are in tension or compression.

NOTE: A – Hinge (pin) and F – Roller.

Solution:
Q 6: For the cantilever beam and loading condition shown in figure. Determine:
1) The equations of shear and moment as a function of \( x \).
2) Draw the shear and bending moment diagrams.
3) The shear and moment at \( x = 4 \) m.

**NOTE:** A – Fixed support

**Solution:**