

Daffodil International University
B.Sc. in Civil Engineering
Mid Term Examination, Summer - 2026
Course Title: Engineering Mechanics
Level: Term: 1-1
Date: July 04, 2026
Teacher's Initial: MHZ, TTL
Time: 1.5 Hours

Note: There are 4 questions. Answer all. (Right side figures indicate full marks)

1. Two spheres are at rest against smooth surfaces, as shown in Fig: 1. Sphere A weighs 4000 lb. and sphere B weighs 1000 lb. Let $F = 1500$ lb. and $\theta = 75^\circ$, and find the reactions at C, D, and E. [CO1, C3]

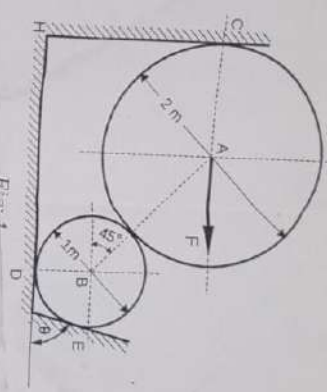


Fig: 1

2. A 2000 lb. wheel with a radius of $R = 15$ in. is acted upon by a force F, in Fig: 2, [6.5] which tends to pull the wheel over the obstruction at A. At the instant the wheel is about to move, the pressure between the wheel and the ground is zero. What is the magnitude of the force F at this instant? Given that, $\theta = 35^\circ$, $h = 6$ " [CO1, C3]

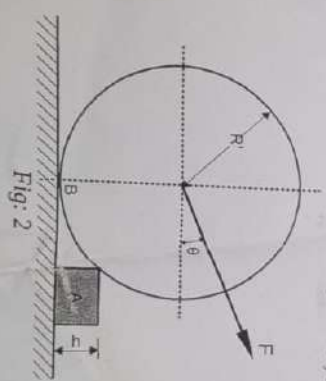


Fig: 2

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3. In Fig: 3, MN is a rigid weightless body, $F = 200 \text{ lb}$, the pegs are smooth, and the [06]
cable is weightless and flexible. Determine the weights of A and B if the bodies are
in equilibrium and MN remains horizontal. Given that, $a = 12 \text{ ft}$, $b = 4 \text{ ft}$, $\theta = 70^\circ$
[CO1, C3]



Fig: 3

4. In the truss of Fig: 4 calculate the forces in members AB, BC, CD, DE, BD. Given [06]
that, $F = 150 \text{ kips}$, $a = 13 \text{ ft}$, $b = 12 \text{ ft}$. [CO1, C3]

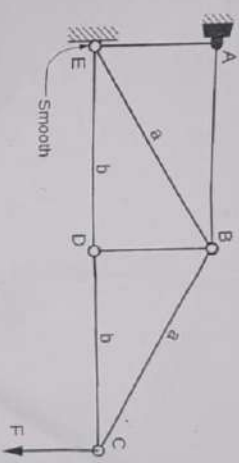


Fig: 4

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