Daffodil International University

B.Sc. in Civil Engineering

Mid Term Examination, Summer - 2026

Course Code: CE 101 | Course Title: Engineering Mechanics

Section: A, B, C | Level-Term: 1-1 | Teacher's Initial: MHz, TTL

Full Marks: 25 | Date: July 04, 2026 | Time: 1.5 Hours

Note: There are 4 questions. Answer all. [Right side figures indicate 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 θ = 75°, and find the reactions at C, D, and E. *[CO1, C3]* [6.5]

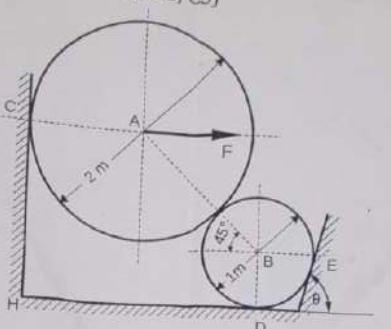


Fig: 1

2. A 2000 lb. Wheel with a radius of R = 15 in. is acted upon by a force F, in Fig: 2, 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, θ = 35°, h = 6" *[CO1, C3]* [6.5]

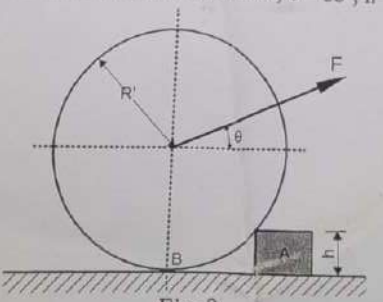


Fig: 2

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3. In Fig: 3, MN is a rigid weightless body, F = 200 lb., the pegs are smooth, and the 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 ft, b = 4 ft, θ = 70° *[CO1, C3]* [06]

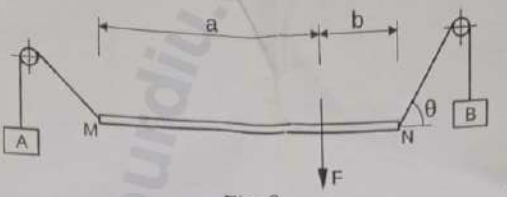


Fig: 3

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

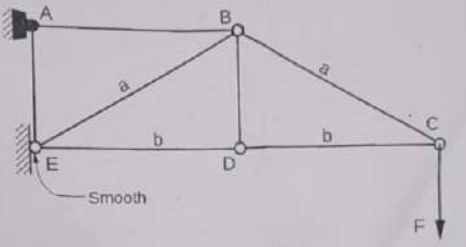


Fig: 4

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