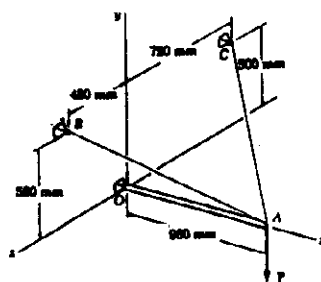


八十五學年度國立台灣工業技術學院研究所碩士班招生考試

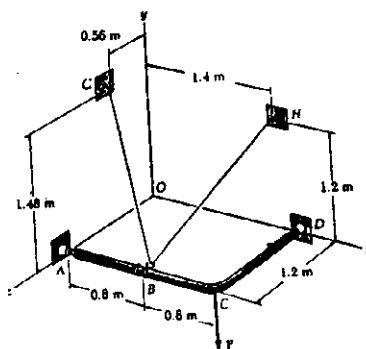
所別：纖維及高分子工程技術研究所 組別：纖維乙組

科目：工程力學

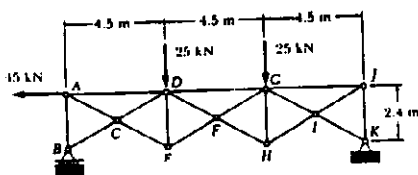
1. The boom OA carries a load P and is supported by two cables as shown. Knowing that the tension in cable AB is 732 N and that the resultant of the load P and of the forces exerted at A by the two cables must be directed along OA, determine the tension in cable AC. (10%)



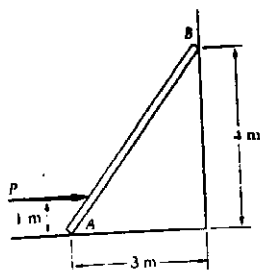
2. The frame ACD is supported by ball-and-socket joints at A and D and by a cable which passes through a ring at B and is attached to hooks at G and H. Knowing that the frame supports at point C a load of magnitude $P = 335$ N, determine the tension in the cable. (15%)



3. Determine the force in members AD, CD, and CE of the truss shown. (15%)



4. A uniform ladder, mass 12 kg, rests against a wall and against a horizontal surface. If the coefficient of friction at A and B is 0.3, find the smallest force P that will prevent motion of the ladder to the left at A. (10%)



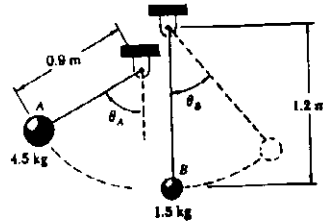
八十五學年度國立台灣工業技術學院研究所碩士班招生考試

所別：纖維及高分子工程技術研究所

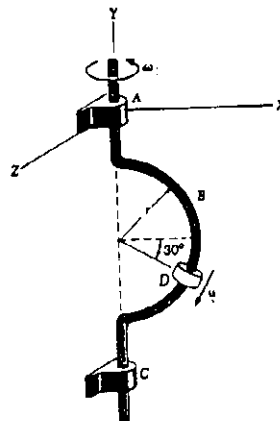
組別：纖維乙組

科目：工程力學

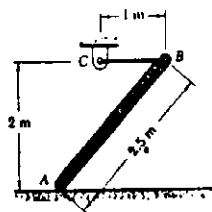
5. The 4.5-kg sphere A is released from rest when $\theta_A = 60^\circ$ and strikes the 1.5-kg sphere B. Denoting by e the coefficient of restitution and knowing that $e = 0.90$, determine (a) the highest position to which sphere B will rise, (b) the maximum tension which will occur in the cord holding B. (15%)



6. The bent rod ABC rotates at a constant ω_1 . Knowing that the collar D moves downward along the rod at a constant relative speed u , determine for the position shown (a) the velocity of D, (b) the acceleration of D. (15%)



7. The 50-kg uniform rod AB is released from rest in the position shown. Knowing that end A may slide freely on the frictionless floor, determine (a) the angular acceleration of the rod, (b) the tension in wire BC, (c) the reaction at A. (10%)



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8. A 5-kg object is falling vertically when, at point D, it explodes into three fragments A, B, and C, weighing, respectively, 1.5 kg, 2.5 kg, and 1 kg. Immediately after the explosion the velocity of each fragment is directed as shown and the speed of fragment A is observed to be 70 m/s. Determine the velocity of the 5-kg object immediately before explosion. (10%)

