淡江大學 106 學年度日間部寒假轉學生招生考試試題

15-1

系別：航空太空工程學系三年級　　科目：工程力學(含靜力學、動力學)

考試日期：1 月 6 日(星期六) 第 1 節　　本試題共 4 大題，　2　頁

1. Please determine the reactions for the three-hinged arch shown in Figure 1. (25%)

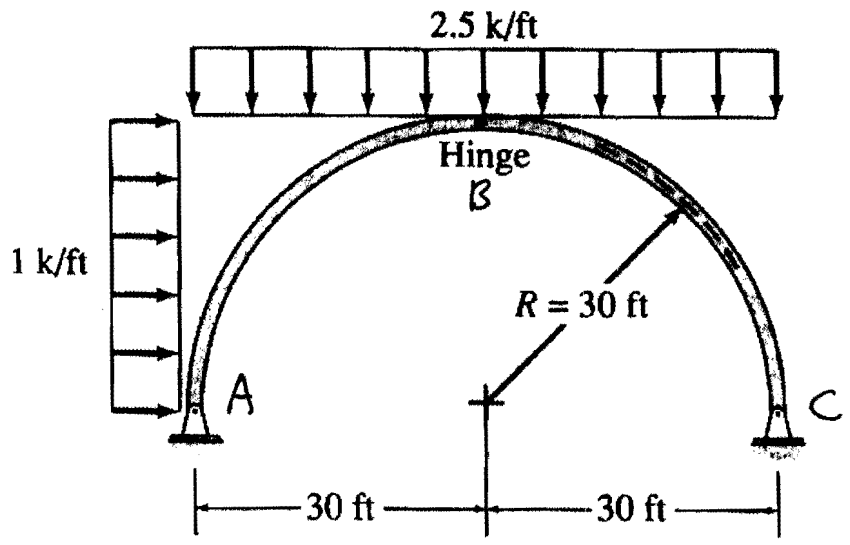

Figure 1

2. Please determine the internal forces in member BC , BG and HG of truss structure shown in Figure 2. (25%)

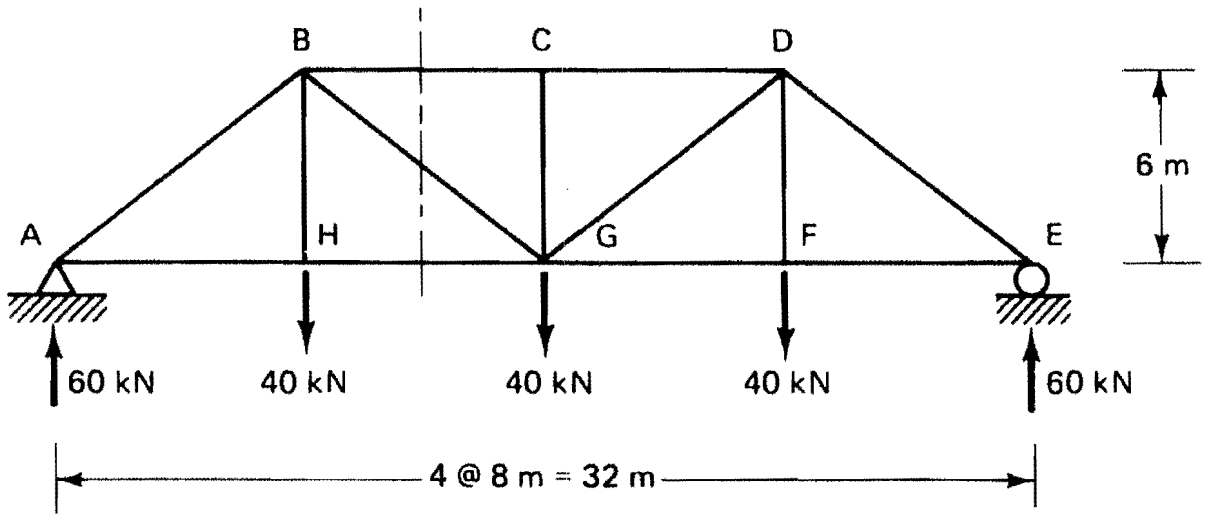

Figure 2

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3. A rocket is released at a point A from a jet aircraft flying horizontally at 1000 km/h at an altitude of 800 m. If the rocket thrust remains horizontal and gives the rocket a horizontal acceleration of 0.5g, please determine the angle θ from the horizontal to the line of sight to the target. (25%)

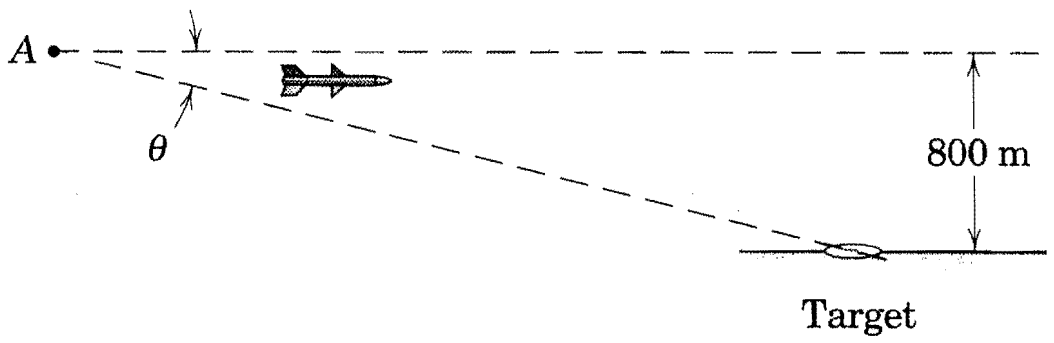

Figure 3

4. The airplane in Figure 4 is maneuvered by giving the control stick an abrupt forward displacement so that the airplane is given a pitching acceleration 6 rad/s^2. The moment of inertia of the airplane about a pitching axis through the center of gravity is 180,000 lb-s^2-in. and the airplane weighing 8,000 lb. Please

(1) Find the tail load P_1 and inertia force Ma_y of the airplane if the wing lift is 67,200 lbs. (Figure 5) (15%)

(2) Find the time required for the airplane to pitch through an angle of 3^o. (If the pitching acceleration is constant) (10%)

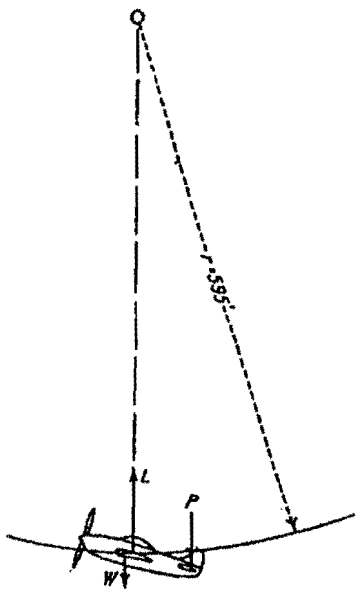

Figure 4

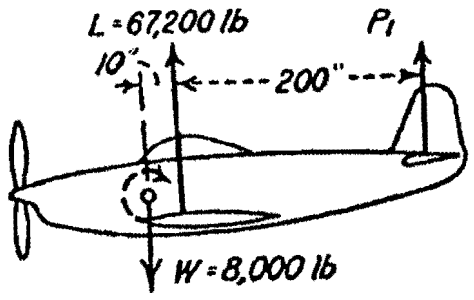

Figure 5