淡江大學九十學年度碩士班招生考試試題

系別：航空太空工程學系　　　　　科目：動　力　學
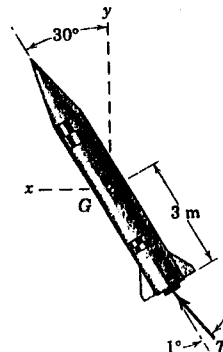
准帶項目請打「○」否則打「×」	
計算機	字典
○	×

1. The launching catapult of the aircraft carrier gives the jet fighter a constant acceleration of 50 m/s² from rest relative to the flight deck and launches the aircraft in a distance of 100 m measured along the angled takeoff ramp. If the carrier is moving at a steady 40 knots (1 knot = 1.852 km/h), determine the magnitude v of the actual velocity of the fighter when it is launched.　　(25%)
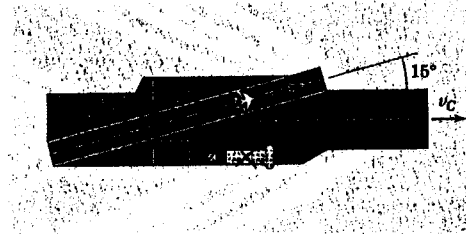
2. Above the earth's atmosphere at an altitude of 400 km where the acceleration due to gravity is 8.7 m/s², a certain rocket has a total remaining mass of 300 kg and is directed 30° from the vertical. If the thrust T from the rocket motor is 4 kN and if the rocket nozzle is tilted through an angle of 1° as shown, calculate the angular acceleration α of the rocket and the x- and y- components of the acceleration of its mass center G. The rocket has a centroidal radius of gyration of 1.5 m.　　(25%)

◄ 注意背面尚有試題 ►

系別：航空太空工程學系　　　科目：動　力　學

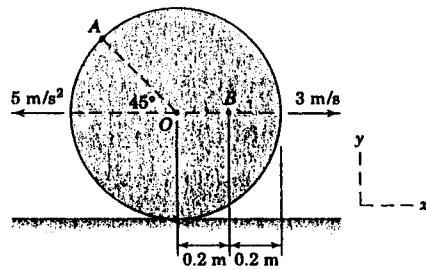| 准帶項目請打「○」否則打「×」	
計算機	字典
○	×

3. The center O of the disk has the velocity and acceleration shown in the figure. If the disk rolls without slipping on the horizontal surface, determine the velocity of A and the acceleration of B for the instant represented. (25%)

4. The jet fighter has a mass of 6500 kg and requires 10 seconds from rest to reach its takeoff speed of 250 km/h under the constant jet thrust $T = 48$ kN. Computer the time average R of the combined air and ground resistance during takeoff. (25%)