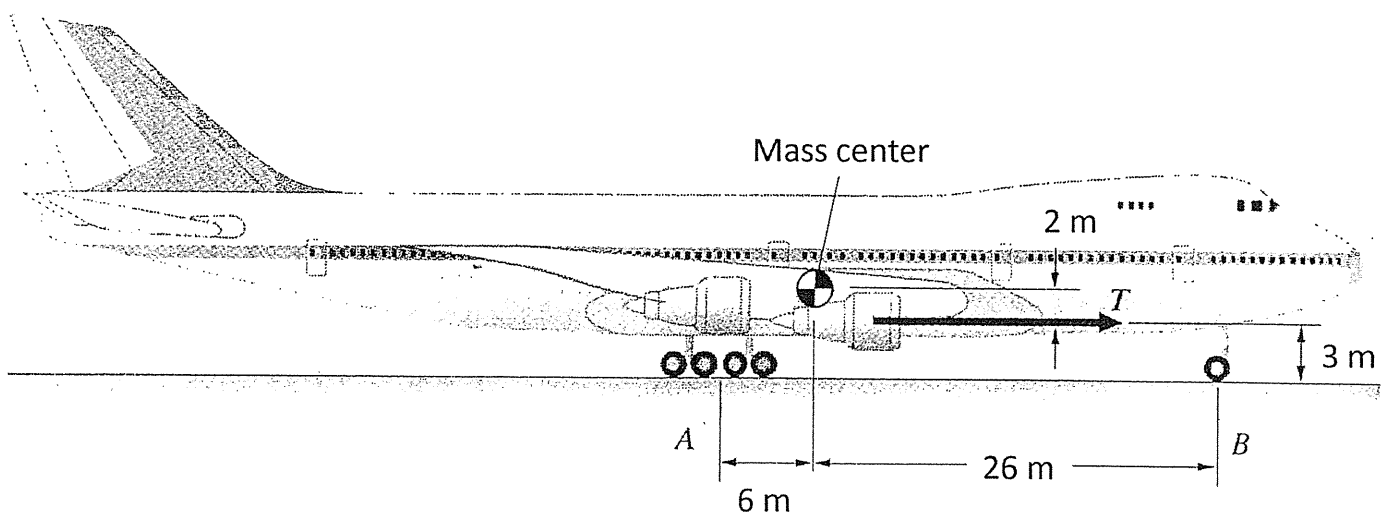


※ 考生請注意：本試題可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. (25%) 請將以下中文名詞翻譯成英文:

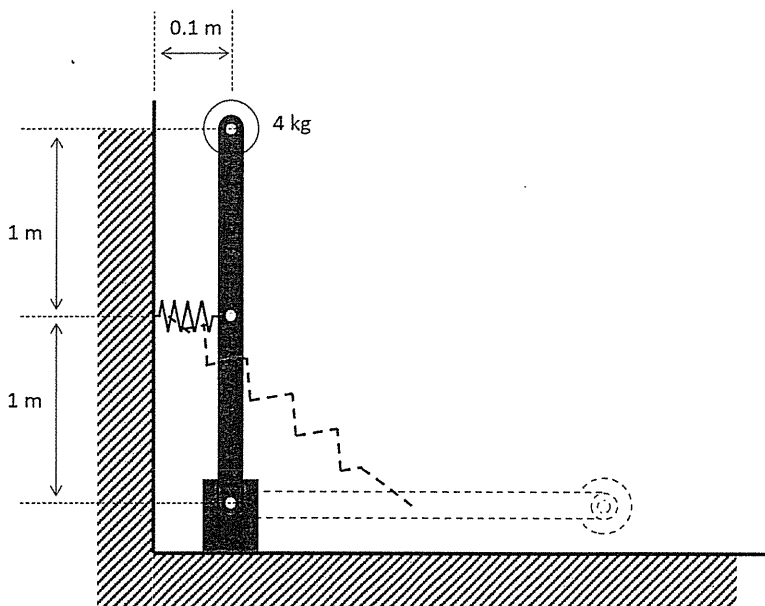
- (1) 正齒輪
- (2) 空氣軸承
- (3) 滾珠螺桿
- (4) 葉片彈簧
- (5) 鉚釘
- (6) 螺絲
- (7) 連軸器
- (8) 疲勞
- (9) 殘留應力
- (10) 電腦輔助工程
- (11) 有限元素分析
- (12) 機動學與機械設計

2. (25%) The mass of the airplane in the following figure is 300 ton (metric), and the thrust force (as denoted in the figure) of its engines during its takeoff roll is $T = 750$ kN. Determine the airplane's acceleration and the concentrated normal forces exerted on its wheels at A and B (as denoted in the figure) if the horizontal friction forces exerted on its wheels (at A and B) are: (1) neglect, and (2) considered, friction coefficient = 0.1.



※ 考生請注意：本試題可使用計算機。 請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

3. (25%) A 9-kg uniform rod is rotating in a vertical plane as shown in the figure below. The rod is 2 m long and has a concentrated mass (4 kg) attached to its end. The angular velocity of the rod is 3 rad/s clockwise when it is vertical. If the undeformed length of the spring is 0.25 m, determine the spring modulus k such that the angular velocity of the rod will be zero when it is horizontal.



4. (25%) Three sliders are connected by rigid rods as shown below. At the instant shown, slider B is moving upward at a rate of 1 m/s. Determine the angular velocity of both rods and the velocity of sliders A and C.

