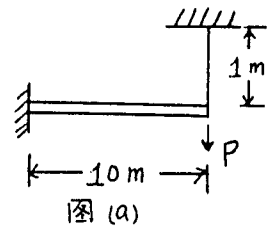


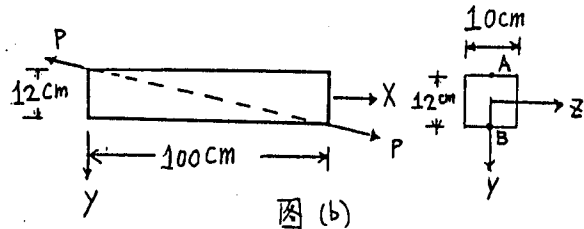
1. 一方形断面之懸臂樑, 自由端由一鋼索 (steel cable) 拉住,

- (20%) 如图 (a) 所示。樑断面為  $50\text{ cm} \times 50\text{ cm}$ , 鋼索断面為  $5\text{ cm}^2$ 。設兩者均為 elastic-perfectly plastic 材料, 降伏應力 (yield stress) 均為  $200\text{ MPa}$  (tension and compression)。試求在樑與索均無塑性變形情形下, 此結構系統所能承受之最大外力  $P$ 。



2. 一矩形樑, 断面為  $b \times h$ , 如图 (b) 所示。若外力  $P$  作用於  $xy$  平面上 A, B 兩點。試求 (20%) 此樑之

- (a) 剪力圖, 彎矩圖  
 (b) 最大正向應力  $(\sigma_x)_{\max}$  及其位置。  
 (c) 最大剪應力  $(\tau_{xy})_{\max}$  及其位置。

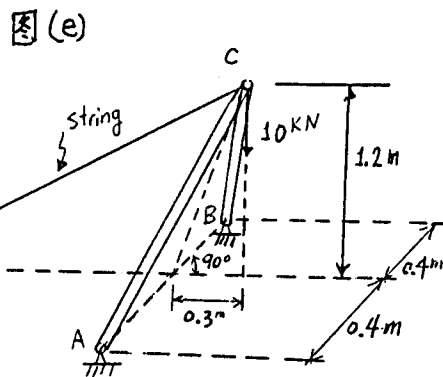
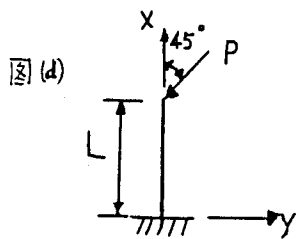
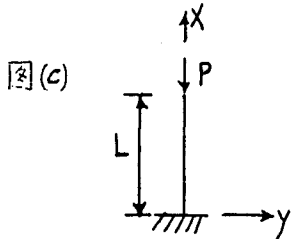


3. (a) By solving the differential equation of the

- (20%) deflection curve, obtain the critical load  $P_{cr}$  for the column of Figure (c).

(b) By solving the differential equation of the

deflection curve, obtain the buckling equation for the column of Figure (d).



4.

- (20%) Two rigid bars AC and BC are supported by the ball and socket at A and B and by a string CD. If the point C is pin connection, determine

- (a) the tension in string CD (10%)  
 (b) the forces in AC and BC (10%)

5. 請解釋下列名詞

- (10%) (a) Coriolis acceleration  
 (b) D'Alembert's principle

6. 如图 (f) 所示, 有一半徑為  $r$  之圓柱及另一半徑亦為  $r$

- (10%) 而厚度為  $h$  之中空圓筒, 於某一時刻皆靜止於相同斜面之同一高度上, 若二者同時釋放, 且假設此二者運動時, 與斜面之間沒有相對滑動, 請問, 若二者之重量相等, 則何者先到達底部?

