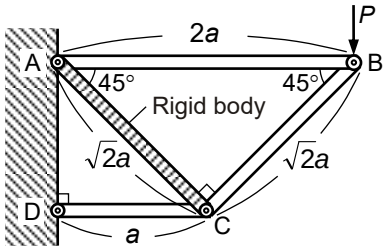
2022 ENTRANCE EXAMINATION FOR INTERNATIONAL MASTER'S PROGRAM
Departments of Mechanical Engineering and Hydrogen Energy Systems

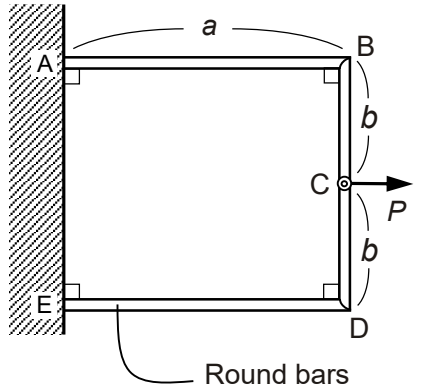
Mechanics of Materials (Group A, B) [09:00~10:30]

Ⅰ Answer the following five questions. (25 Points)
The force *P* will deform the structure shown in the right figure.
(1) Obtain the internal force acting on bar AB. (4 Points)
(2) Obtain the internal force acting on bar BC. (4 Points)
(3) Obtain the internal force acting on bar CD. (4 Points)
(4) Obtain the displacement in the horizontal direction at point C. (6 points)
(5) Obtain the displacement in the vertical direction at point B. (7 points)



AB, BC and CD: Elastic body
(Young's modulus: *E*
Cross sectional area: *A*)
⊙ : Pin joint

Ⅱ Answer the following two questions. (25 Points)
The force *P* will deform the structure shown in the right figure.
(1) Obtain the displacement in the horizontal direction at point C. (15 points)
(2) Draw the SFD (Shearing Force Diagram) and BMD (Bending Moment Diagram) between points A and B. (10 points)



Round bars
Young's modulus: *E*
Diameter: *d*
⊙ : Pin joint