

國立中山大學 101 學年度碩士暨碩士專班招生考試試題

科目：工程力學(含靜力與材力)【海洋環境及工程學系碩士班】

題號：4170
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1. Please describe the following terms in English. (10%)

- (a) Saint Venant Principle
- (b) Principal plane

2. Please draw the shear force and bending moment diagram of the beam shown in Fig. 1. (20%).

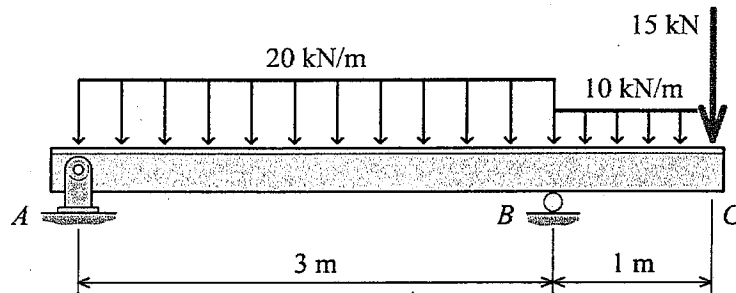


Fig.1

3. The machine part shown in Fig. 2 is 200 mm wide by 25 mm thick and is made of 2014-T4 aluminum (the yield stress is 290 MPa). Determine the maximum safe load P if a factor of safety of 2.25 with respect to failure by yield is specified. (20%)

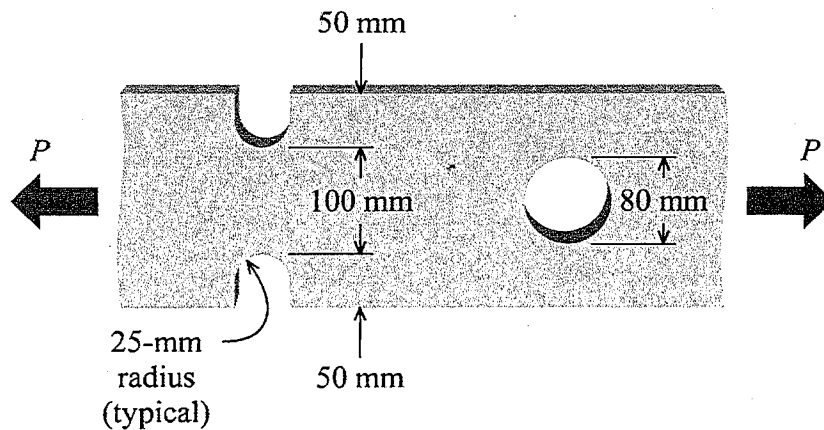


Fig. 2

4. As shown in Fig.3, the length of bar AB is 350 mm. The moments exerted about points B and C by the vertical force F are $M_B = -1.75$ kN-m and $M_C = -4.20$ kN-m. Determine the force F and the length of bar AC . (15%)

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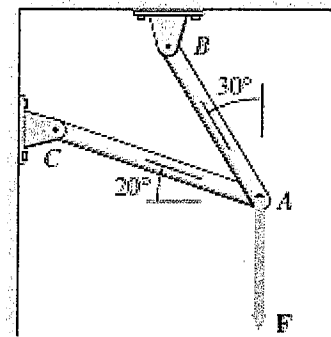


Fig. 3

5. The cross section of an earth-fill dam is shown in Fig. 4. Determine the coefficients a and b so that the y coordinate of the centroid of the cross section is 10 m. (15%)

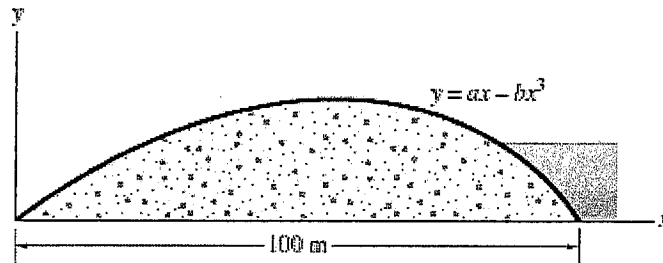


Fig. 4

6. From Fig.5, please find the reaction force at E and the axial load in member BD of the frame? (20%)

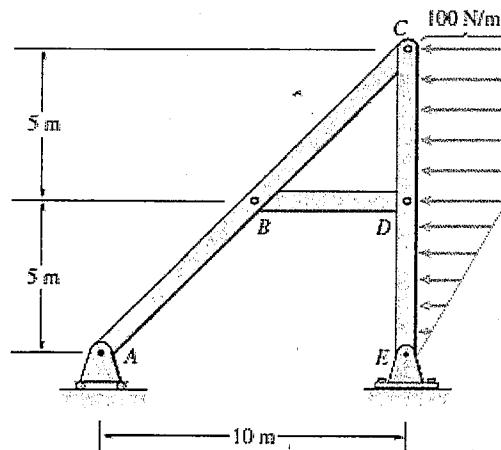


Fig.5