

## **Problem 2:**

From Table 1 of Lecture No. 10, the failure load,  $P_{fail}$ , is

$$P_{fail} = \frac{K_{Ic} B \sqrt{W}}{f(a/W)} \quad (1)$$

i.e., the failure load is inversely proportional to the geometry correction factor,  $f(a/W)$ . Using Equation 1, the calculated values of  $f(a/W)$  and corresponding failure loads are tabulated below:

| <b>Geometry</b> | <b><math>f(a/W) = f(0.5)</math></b> | <b><math>P_{fail}</math>, kN (kip)</b> |
|-----------------|-------------------------------------|--|
| SENT            | 3.543                               | 64.63 (14.53)                          |
| SENB            | 10.65                               | 21.50 (4.83)                           |
| CCT             | 0.743                               | 308.20 (69.29)                         |
| DENT            | 0.742                               | 308.62 (69.38)                         |
| COMPACT         | 9.659                               | 23.71 (5.33)                           |

It is obvious that the DENT specimen has the highest failure load and the SENB specimen has the lowest failure load (for fixed  $B$ ,  $W$ , and  $a$ ), because, their  $f(a/W)$  values are smallest and largest, respectively.