

AEE 461- Design of Aircraft Structures - Final exam -	Student Name	Student No	08.06.2017

Questions

1. (60 points) The interface load from a system bracket is shown below. The details of the structures are given in next pages.

Allowables for the extruded member(Z-kiris) made of 2024-T3 aluminum alloy material are given as

$$F_{tu} = 415 \text{ MPa}$$

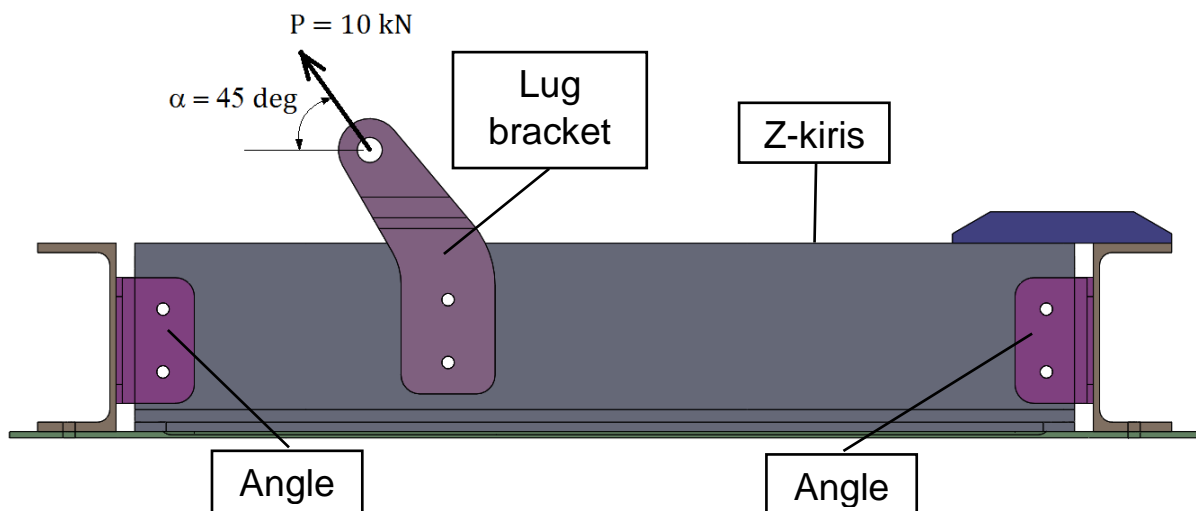
$$F_{ty} = 300 \text{ MPa}$$

$$F_{cy} = 315 \text{ MPa}$$

$$E = 72000 \text{ MPa}$$

So,

- Find the magnitude and direction of the beam reactions at the supports.
- Draw a free-body diagram of the structure with the balanced set of applied loads and reaction forces properly indicated.
- Calculate the maximum bending stresses using combined bending equations and axial stresses for the most critical cross-section.
- Calculate the margins of safety with assuming a design load factor, $j = 1.5$.
- Obtain the rivet forces at angles and lug bracket.



2. (40 points) Explain what kind of failure modes can be seen in lug-pin joints.