MET 4501 Fall 2024: Practice In-Class Quiz 7  Name:

INSTRUCTIONS:

This quiz is open-book and open-note, and you may work with your classmates. Please answer all questions and show all of your work.

GIVEN:

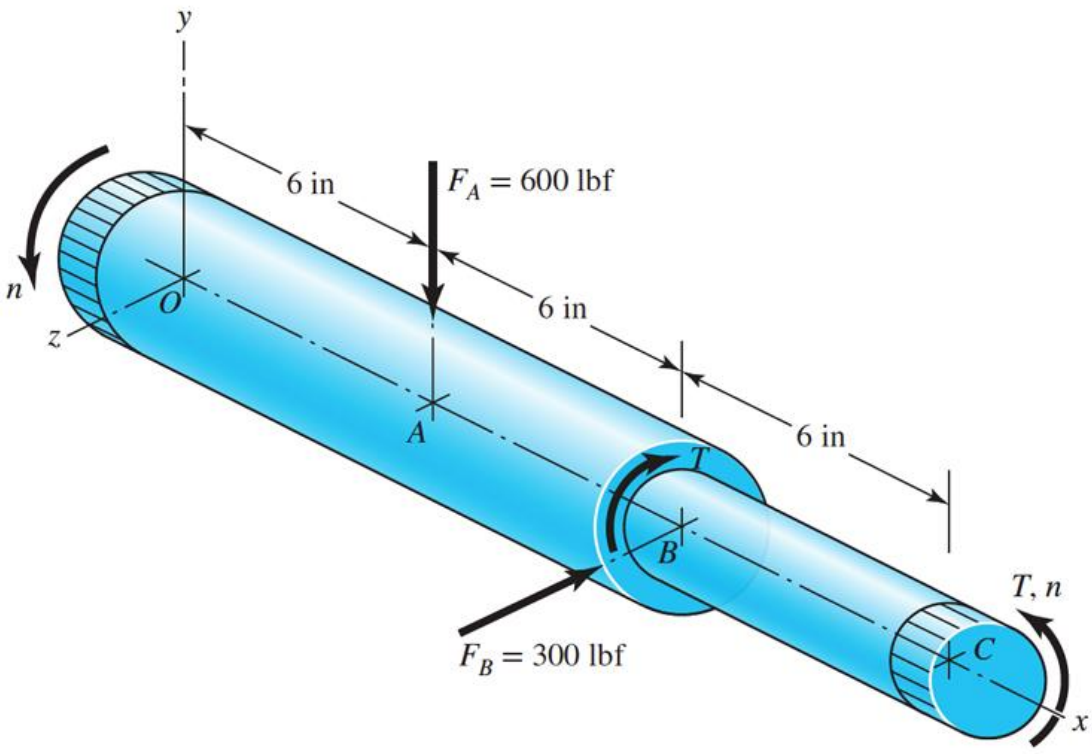
The steel shaft shown is supported by journal bearings at locations *O* and *C*. Dimensions are in inches.

The lubricant is SAE 40 and the operating temperature is 200 °F.

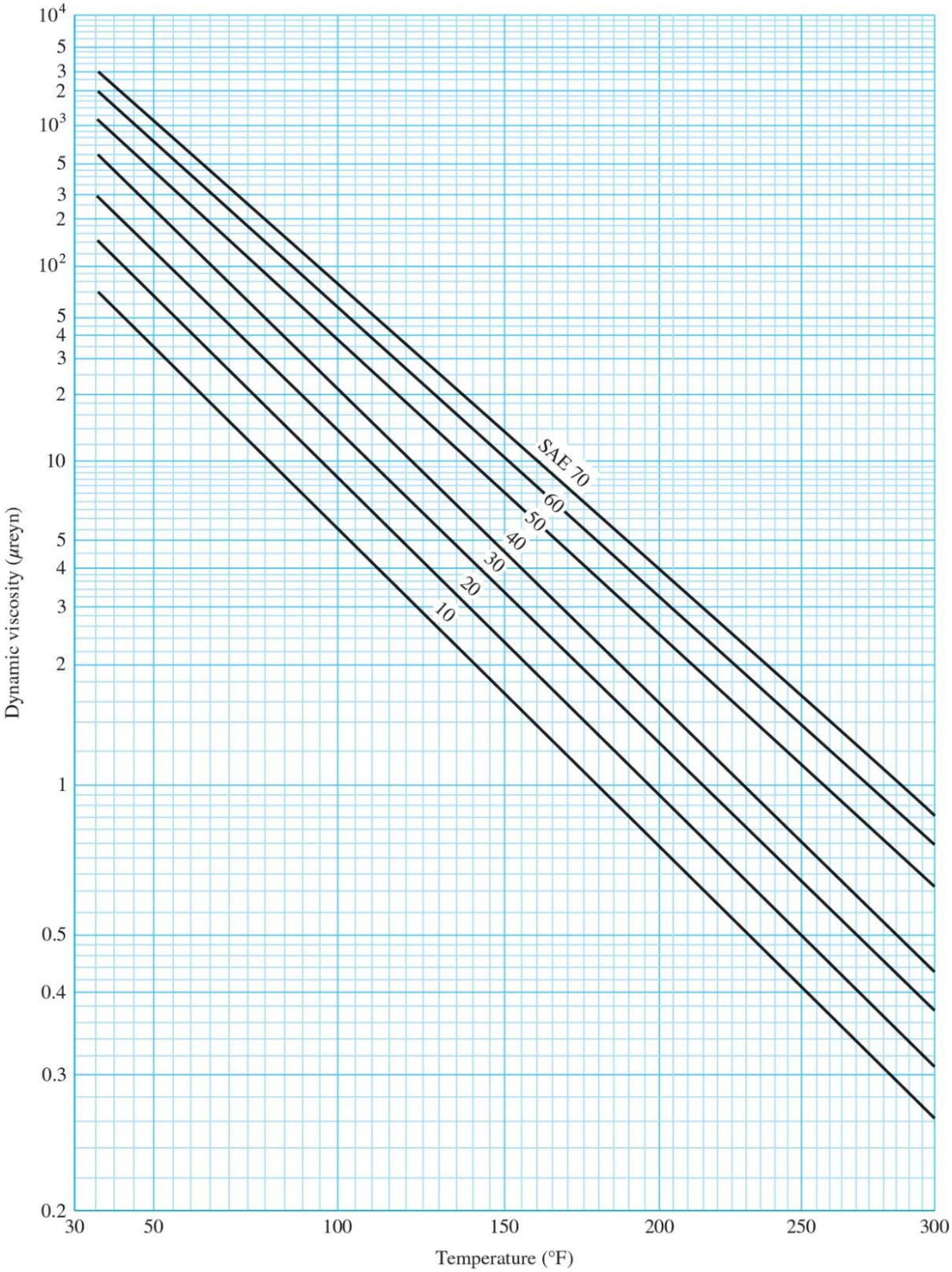
The shaft rotates at 1200 rpm.

The shaft diameter at *O* is 3.250 in and the bearing (bore) diameter is 3.256 in. The bearing is 3 in long.

Note that 1 reyn = 1 lbf·s/in$^2$= 1 psi·s




FIND:

(a) The radial load supported by bearing *O*.
(b) The Sommerfeld number S for the bearing at *O*.

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