Name:

Closed Book Exam. You may use one sheet of paper (front & back) as a reference during the exam.

- 1. Wooden member AC is supported by a 0.525 inch diameter pin fitted into a round hole near end C. For this member, determine:
- a. The maximum normal stress in the wood?
- b. The average bearing stress in the wood?
- c. The distance 'd' required for which the average shearing stress is 75 psi along the surfaces indicated by the dashed lines.



- 2. Rigid beam *ABE* is supported by two steel rods ($E = 30 \times 10^6$ psi) and subjected to a 1600-lb load applied at *E*. The length of beam *ABE* is L = 15.6 ft. Determine:
- a. The change in length of rod AC
- b. The change in length of rod *BD*
- c. The angle formed between beam *ABE* and a horizontal reference line.



- 3. Two solid shafts are glued at *B* and attached to fixed walls at *A* and *C*. A torque of 13.5 in.-kip is applied at B. The shear moduli for aluminum and brass are: $G_{al} = 3.85 \times 10^6$ psi, $G_{br} = 5.75 \times 10^6$ psi. Determine:
- a. The reaction at A
- b. The reaction at C

