Assignment 2

Due on 2020-03-11, 23:59 IST.

1. Hooke's law applies to the ________
   - elastic
   - plastic
   - viscous
   - elastic-plastic region
   [Answer: elastic]
   [Accepted Answer: elastic] 1 point

2. If the force is applied in the direction, Poisson's ratio is given by (if u is the strain)
   - u/v
   - v/u
   - -v/u
   [Answer: -v/u]
   [Accepted Answer: -v/u] 1 point

3. A wire of length 12 mm and dia of 8 mm has a 40 N force applied downwards producing an elongation of 0.01 mm. What is the stress acting on the wire in MN/m²?
   - [Answer: 0.005]
   [Accepted Answer: 0.005] 1 point

4. In problem 1, what is the strain?
   [Answer: 0.002]
   [Accepted Answer: 0.002] 1 point

5. In problem 2, what is the Young's modulus in MN/m²?
   [Answer: 200000]
   [Accepted Answer: 200000] 1 point

6. A stress of 0.1 MPa is required to stretch a 1 cm guide tube to 1.1 cm. After 2 hours in the same stretched position the tube deforms a stress of 1.5 MPa. What is the stress relaxation time in hours?
   [Answer: 0.002]
   [Accepted Answer: 0.002] 1 point

7. A wire is stretched to 10%. When the stress is released it recovered 35% of its strain after 5 hrs. What is the relaxation time in hours?
   [Answer: 0.002]
   [Accepted Answer: 0.002] 1 point

8. With ref to Q. 7. What is the amount of strain recovered (in %) after 6 hrs of its original value?
   [Answer: 0.002]
   [Accepted Answer: 0.002] 1 point

9. Dry bone contains organic 20% w/w, and mineral = 70% w/w and their corresponding Modulus are 10 and 100 GPa respectively. Calculate the modulus of the bone using Hooke's law.
   [Answer: 0.002]
   [Accepted Answer: 0.002] 1 point

10. Molecular weight of a biodegradable polymer decreases from 1 x 10^6 to 1 x 10^5 in 30 days in a first order manner. What will be its molecular weight after 450 days?
    [Answer: 0.002]
    [Accepted Answer: 0.002] 1 point