KALLAM HARANADHAREDDY INSTITUTE OF TECHNOLOGY
DEPARTMENT OF CIVIL ENGINEERING
SUB: STRENGTH OF MATERIAL =II
TUTORIAL –III   A.Y:2018-19

KHIT

CGPA:3.2

1. What do you understand by Theories of failure? Name the important theories of failure?
2. Derive an expression for the distortion energy per unit volume when a body is subjected to principal stresses σ_1, σ_2, and σ_3.
3. The principal stresses at a point in an elastic material are 22 N/mm^2 tensile , 110 N/mm^2 tensile and 55N/mm^2 compressive .
   If the elastic limit in simple tension is 220N/mm^2 and μ=0.3, then determine whether the failure of material will occur or not according to
   i)   Maximum principal stress theory ,
   ii)   Maximum principal strain theory,
   iii)   Maximum shear stress theory
   iv)   Maximum strain energy theory
   v)   Maximum shear strain energy theory
4. Determine the diameter of a bolt which is subjected to an axial pull of 12kN together with a transfers shear force of 6KN, when the elastic limit in tension is 300N/mm^2 ,factor of safety =3 poisson's ration =0.3 using:
   i)   Maximum principal stress theory ,
   ii)   Maximum principal strain theory,
   iii)   Maximum shear stress theory
   iv)   Maximum strain energy theory
   v)   Maximum shear strain energy theory
5. A bolt is under an axial thrust of 7.2kN together with a transfers shear force of 3.6kN. calculate the diameter of the bolt according to:
   i)   Maximum principal stress theory ,
   ii)   Maximum principal strain theory,
   iii)   Maximum shear stress theory
   iv)   Maximum strain energy theory
   v)   Maximum shear strain energy theory