Q 5.1 If you had to perform a Uniaxial Compressive Strength Test on rock, what **standard procedures** would you consult? (name at least 2) **[4]**

first #'d make sure that my specimen is cylindrical, smooth and flat. Diameter of specimen should be ≥ 54mm and the height to diameter ration should be between 3.5 – 2.0. I would use a uniaxial test method and compress the rock until its maximum resistance of stress by the load

Q 5.2 What happens when a rock material has a Poisson's Ratio $\nu = 0.5$ **[3]**

This means that the lateral strain of a rock is half the axial strain or $\varepsilon_a = 2\varepsilon_l$. The rock at $\nu = 0.5$ gets deformed and strained, the strain in the axial direction of a rock material becomes twice that of elongation or lateral one

1½

Q 5.3 Explain the term Young's Modulus (E-Modulus) and give formula **[4]**

Is the change in stress over the change in axial strain

$E = \frac{\Delta\sigma}{\Delta\varepsilon_a}$ ✓ $\Delta\sigma$ = Change in Stress

$\Delta\varepsilon_a$ = Change in axial Strain

3

Q 5.4 For all practical purposes steel has constant values for E and ν. Briefly explain why for rock it is necessary to define different E's and ν's and name and explain these. What other variable would you have to state when listing values for E and ν ? **[8]**

To identify by how much/amount the rock was deformed and strained mostly in terms of ratios. E's give us the relationship between the axial strain and stress a rock is experiencing/has experienced

ν's tell us by what much duration of lateral strain to axial strain our rock was deformed/strained. $E = \frac{\Delta\sigma}{\Delta\varepsilon_a}$ ∴ in E; $\Delta\sigma$ (change in stress) should be stated and $\Delta\varepsilon_a$ (Change in axial strain). E is young's modulus In ν (poisson's ratio) the lateral strain (ε_l) and the axial Strain (ε_a) should be stated because $\nu = \frac{\Delta\varepsilon_l}{\Delta\varepsilon_a}$

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