

QUESTION 3 [17]

- 3.1 Name at least 3 methods for determining the in-situ stress in rock. [6]
- 3.2 Briefly describe one of the methods. [8]
- 3.3 What are principal stresses (when reporting the stress at a point)? [3]

QUESTION 4 [16]

- 4.1 List the 3 requirements for rocks to exhibit swelling behaviour. [9]
- 4.2 Make a very rough sketch of an apparatus used to measure the unconfined swelling strain of a rock specimen. Name the important components. [7]

QUESTION 5 [12]

- 5.1 Briefly describe P-waves and S-waves. [6]
- 5.2 What parameters would you require to calculate the 'dynamic elastic properties' of rock? [6]

QUESTION 6 [10]

- 6.1 For rocks, how does the rate of loading affect the result of strength tests? [5]
- 6.2 Sketch typical 'creep' curves for rocks. [5]

QUESTION 7

- Very briefly describe either the Cerchar abrasivity test or the Sievers Miniature Drill test. What are the results of the chosen test method used for? [8]