

**Question 2.2** If you had to determine the above strength characteristics graphically then make a rough sketch showing how you would plot the results and also show where you would read off the characteristics:- UCS; Phi; C. .... [5]

← see opposite page for answer

(1)

### Question 3

← see answer on opposite page

**Test specimen No: UCM 456**

Failure Load:

150kN

Diameter of the cylindrical specimen:

54 mm

Point No	Load kN	Stress MPa	Strain (microstrain units) $\div 1000 = \text{MPa}$	
			Axial	Lateral
0	0	0	0	0
1	1		20	6
2	1.8		30	10
...	...		...	...
25	50		1200	450
...	...		...	...
30	75		1800	600
...	...		...	...
35	100		2400	750

The table above presents extracts from the results obtained during a Uniaxial Compression test conducted on a rock test specimen.

- 3a Calculate the UCS of the test specimen. .... [4]
- 3b Calculate the Modulus E-sec (50% UCS). .... [3]
- 3c Calculate the Modulus E-tan (50% UCS). .... [5]
- 3d Explain briefly why the two E-values differ. .... [4]
- 3e Calculate the modulus ratio (tan 50% UCS). .... [2]
- 3f Calculate the volumetric strain at 50% UCS. .... [2]
- Which parameters are used for the Deere Miller Classification ... [2]
- 3h Calculate the Poisson's ratio (tan 50% UCS) ... [4]

(3)

(9)

P.T.O

### Question 4

Q.4a Name two methods suitable for the determination of the E modulus of the rock mass.

• Secant method. plate loading. .... [4]

• Tangent method. Flat jack.