



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

**NATIONAL CERTIFICATE
BUILDING SCIENCE N1**

3 February 2022

This marking guideline consists of 6 pages.

QUESTION 1

- 1.1 False
 1.2 True
 1.3 True
 1.4 False
 1.5 True

(5 × 2) [10]

QUESTION 2

- 2.1 The mass per unit volume of a substance is called density and it is expressed in g/cm^3 or kg/m^3 . (3)

2.2 $V = l \times b \times h$ ✓
 $= 0,35 \times 0,15 \times 0,05 \text{ m}$ ✓
 $= 0,002625 \text{ m}^3$ ✓

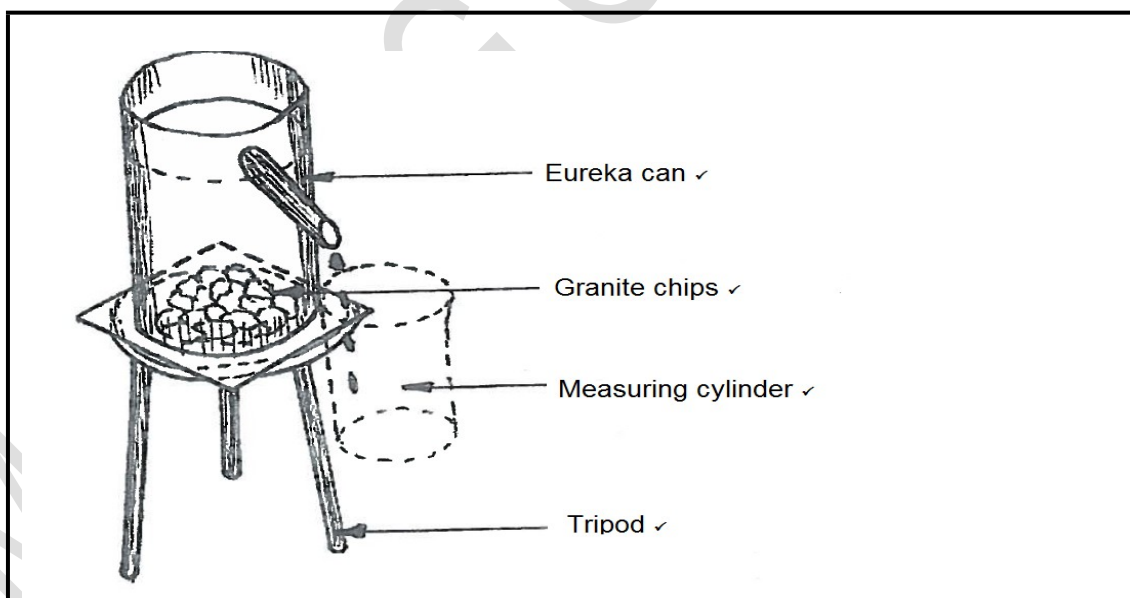
$$D = \frac{m}{v}$$

$$= \frac{26}{0,002625}$$

$$= 9\,904,76 \text{ kg/m}^3$$
 ✓✓

(6)

2.3



(4)

- Place the Eureka can on a tripod and fill it with water up to the spout. Place the measuring cylinder under the spout of the Eureka can and gently lower the granite chips into the water.
- The displaced water will begin to run down the spout into the measuring cylinder. The quantity of displaced water is measured in the cylinder and that measurement will be the volume of the granite chips.

(2)
[15]

QUESTION 3

- 3.1 3.1.1 Seasoning is the process of drying out a certain amount of moisture from the cells and cell walls of timber.
- 3.1.2 Conversion is the process of sawing logs into planks and board.
- 3.1.3 Preservation is the treatment of wood to prevent fungi and insects to break it down. (Also relevant: To make it water-repellent; delay rot, decay and warping; prevent against mold and mildew; protects against freeze/thaw cycles.) (3 × 2) (6)
- 3.2 • Sodium fluoride
• Magnesium silicofluoride
• Mercuride chloride
• Zinc chloride (4 × 1) (4)
- 3.3 $M.C = \frac{\text{original weight} - \text{dryweight}}{\text{dry weight}} \times 100$
- $M.C = \frac{1\,250\,g - 985\,g}{985\,g} \times 100$
- $M.C = \frac{265}{985} \times 100$
- $M.C = 26,90\%$ (4)
[14]

QUESTION 4

- 4.1 The volume of a gas varies directly as its absolute temperature changes, if the pressure is kept constant. (3)
- 4.2 $P^1 V^1 = P^2 V^2 \checkmark$
- $P^2 = \frac{(6)(350)}{(3)} \checkmark$
- $P^2 = 700\,kPa \checkmark$ (3)

4.3 Density = $R.d \times \text{density of material}$

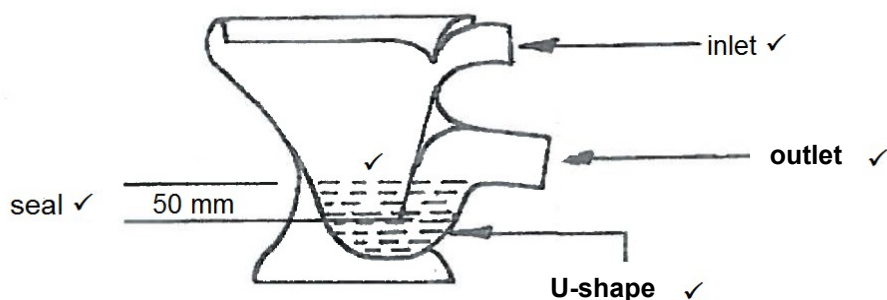
$$\text{Density} = 1,02 \times 1\,000 \text{ kg/m}^3 \checkmark$$

$$= 1\,020 \text{ kg/m}^3 \checkmark$$

$$\begin{aligned} P &= h \times d \times g \\ &= 70 \times 1\,020 \times 10 \checkmark \\ &= 714\,000 \text{ Pa} \checkmark \\ &= 714 \text{ kPa} \checkmark \end{aligned}$$

(5)

4.4

(5)
[16]

QUESTION 5

5.1 The equilibrant of two or more forces is the single force that will bring these two or more forces to rest or balance them.

(4)

5.2 5.2.1 Resultant force = $960 \text{ N} - 600 \text{ N} \checkmark$
 $= +360 \text{ N upward} \checkmark \checkmark$

5.2.2 Equilibrant force = $960 \text{ N} - 600 \text{ N} \checkmark$
 $= -250 \text{ N downward} \checkmark \checkmark$

(2 × 3) (6)

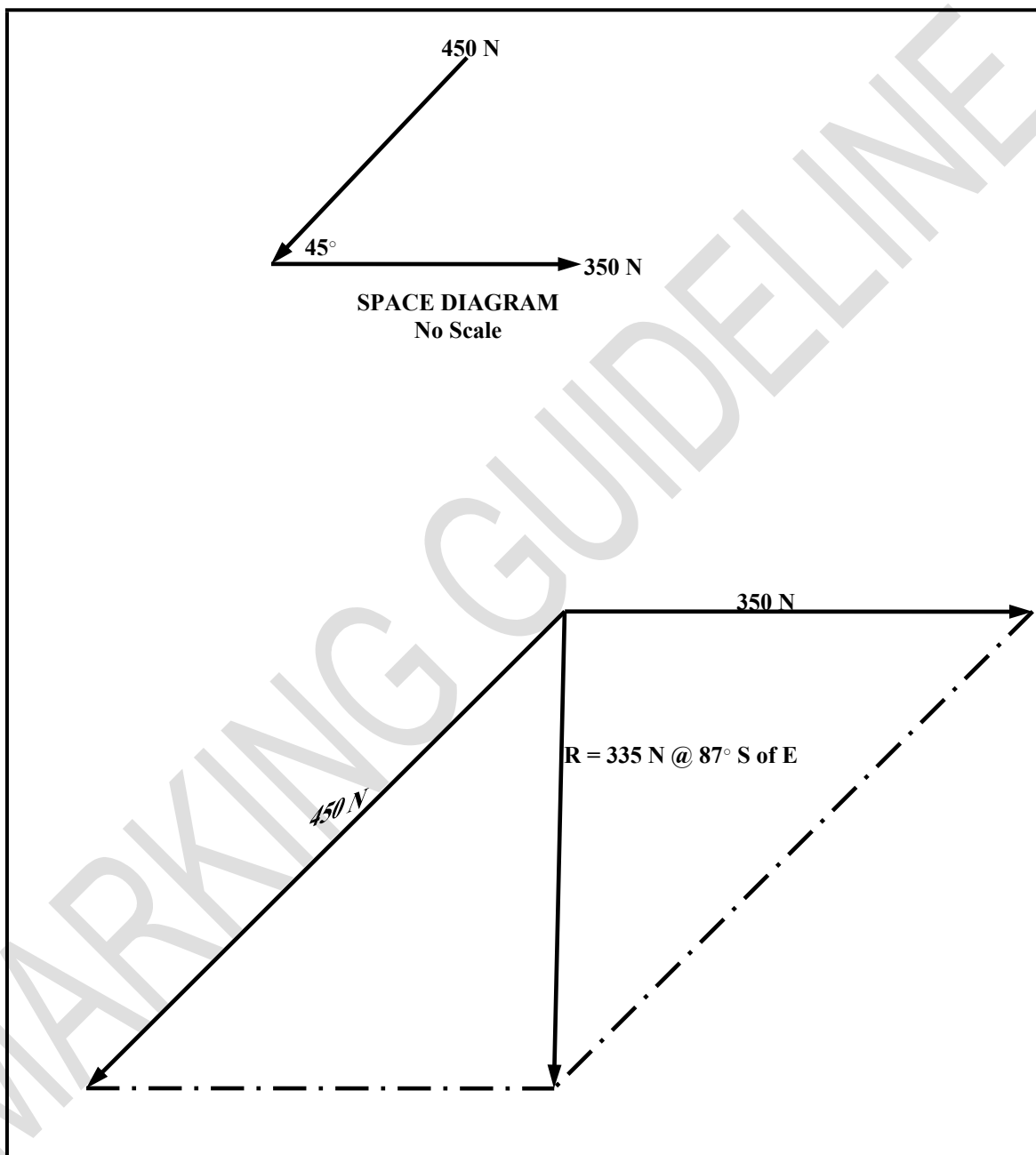
5.3 $HC = F \cos \theta \checkmark$ $VC = F \sin \theta \checkmark$
 $HC = 70 \cos 60^\circ \checkmark$ $VC = 70 \sin 60^\circ \checkmark$
 $HC = 35 \text{ N} \checkmark$ $VC = 60,62 \text{ N} \checkmark$

(6)
[16]

QUESTION 6

- 6.1 If two forces acting at a point are represented in size and direction by two adjacent sides of a parallelogram, the resultant of the two forces is represented in size and direction by the diagonal of the completed parallelogram drawn from where the forces act. (4)

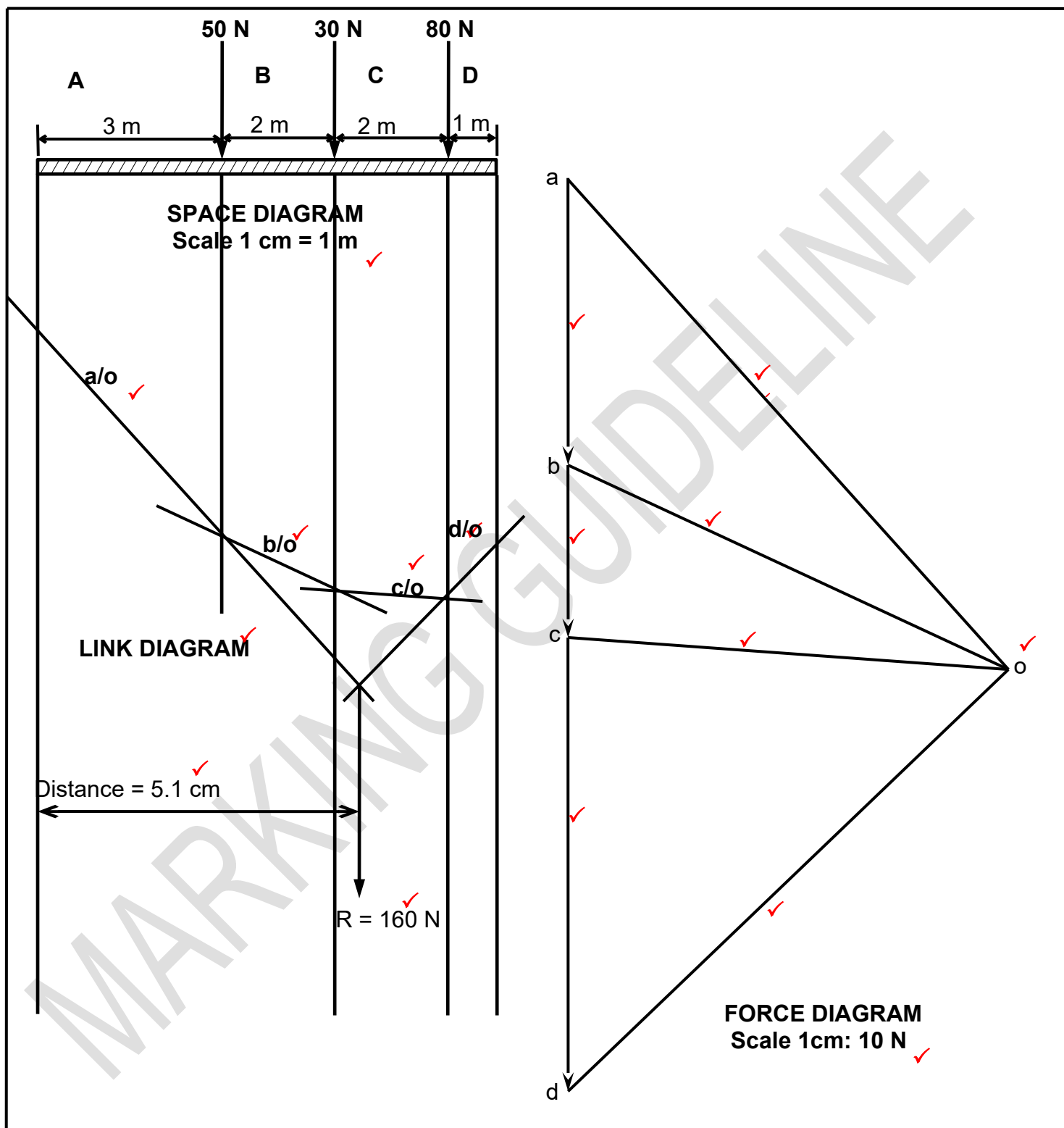
6.2



No Scale to the Drawing
FORCE DIAGRAM
Scale 1 cm: 50 N

(8)
[12]

QUESTION 7



[17]

TOTAL: 100