higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

RIGGING THEORY N2

(11041852)

25 November 2024 (X-paper)
09:00–12:00

Drawing instruments and non-programmable calculators may be used.

This question paper consists of 7 pages and 1 formula sheet.

108Q1E2425

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
RIGGING THEORY N2
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Use only a black or blue pen.
5. Write neatly and legibly.

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QUESTION 1

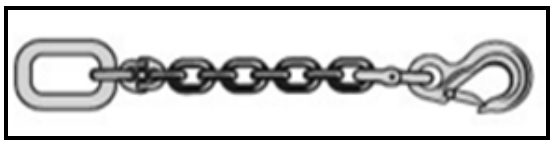
1.1 FIGURE 1 below (A–C) shows different wire rope slings used during a rigging process. Write the name of the type of sling next to the letter (A–C) in the ANSWER BOOK. (3)



A



B



C

FIGURE 1

1.2 List FIVE advantages of man-made fibre ropes over natural fibre rope. (5)

1.3 Rope haulages can be divided into three basic types. Name THREE types of rope haulages. (3)

1.4 There are different types of splices used in wire ropes. Explain the purpose of the splice mentioned below.

1.4.1 Long splice (2)

1.4.2 Short splice. (3)

1.5 State FOUR important factors in favour of the triangular strand ropes. (4)
[20]

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QUESTION 2

2.1 Name THREE types of stresses that occur in rigging work. (3)

2.2 List FOUR types of rope blocks used during a rigging process. (4)

2.3 FIGURE 2 shows different types of equipment used during a rigging process. Write the letters (A–C) and name each type of equipment in the ANSWER BOOK. (3)



A



B



C

FIGURE 2

2.4 List FIVE inspections that must be carried out on the chain block. (5)
[15]

QUESTION 3

3.1 Explain what a snatch block is. (2)

3.2 Explain the purpose of mushroom rollers in rigging. (3)

3.3 List TWO visual inspections an operator must carry out in underground trucks, cars and attachments. (2)

3.4 Draw a neat sketch of a safety guard protecting a wheel on the winch. (3)
[10]

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QUESTION 4

4.1 FIGURE 3 shows different pulleys used on winches. Write the name of each pulley next to the letters (A–C) in the ANSWER BOOK. (3)



A **B** **C**

FIGURE 3

4.2 List FOUR main categories of mine hoists in South Africa. (4)

4.3 Draw a neat sketch of a 30° progressive groove in traction elevators. (2)

4.4 Explain the following regarding platform winders for sinking shafts.

4.4.1 Construction (3)

4.4.2 Breaking strength (3)

[15]

QUESTION 5

5.1 FIGURE 4 shows components of a lifting device. Label the parts (A–D) in the ANSWER BOOK. (4)

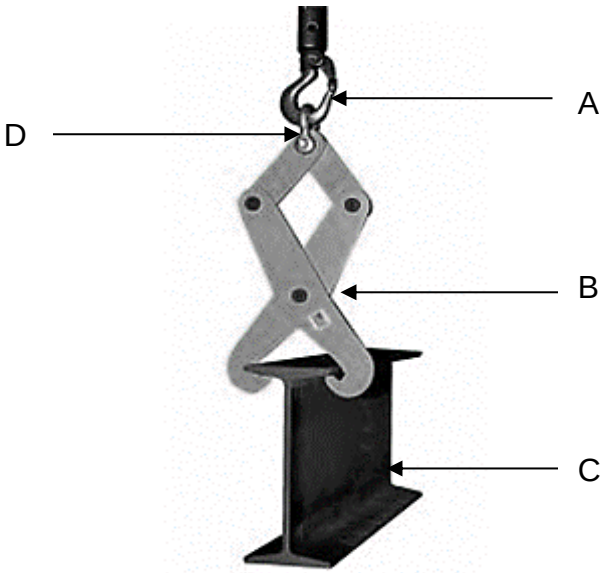

FIGURE 4

5.2 Explain how you would detach the lifting device in QUESTION 5.1 after completing the task. (4)

5.3 Can the lifting device shown in QUESTION 5.1 lift up a flat sheet of metal plate (1 200 × 2 400 × 6 mm)? Explain your answer. (2)
[10]

QUESTION 6

6.1 FIGURE 5 shows the correct and incorrect way of hooking a sling on an eye bolt to lift a load. Study the figure and answer the questions that follow.

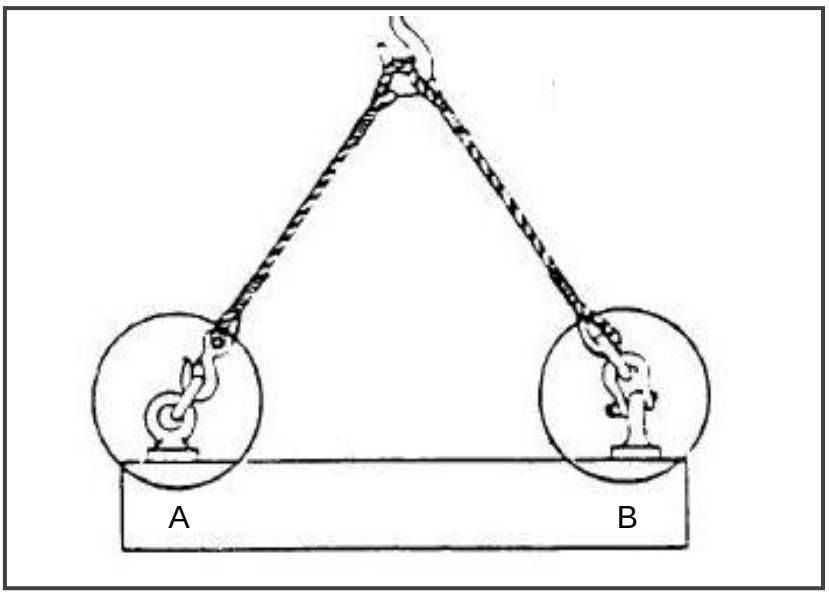

FIGURE 5

6.1.1 State which is the correct method (A or B). (1)

6.1.2 Explain why it is the correct method. (2)

6.2 Draw a neatly labeled sketch of a screw jack. (5)

6.3 List THREE types of dead-man anchorage used for winches and guys. (3)

6.4 Explain the assembly process of a tripod derrick anchor. (4)

6.5 List FIVE types of mobile cranes used during a lifting process. (5)
[20]

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QUESTION 7

7.1 FIGURE 6 below shows a trolley that has to be pulled up an incline. Calculate the length of the incline B. (3)

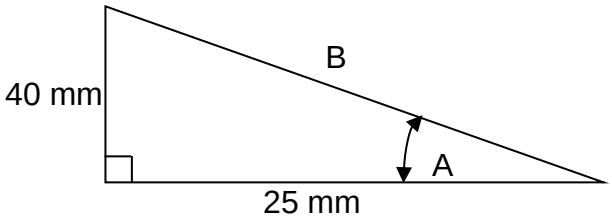

FIGURE 6

7.2 An object has a mass of 300 kilograms which is raised 20 metres in a vertical position. Calculate the work done to raise the object vertically (g = 9,81 m/s²). (4)

7.3 FIGURE 7 shows the centre of gravity of an object. Calculate the centre of gravity. (3)

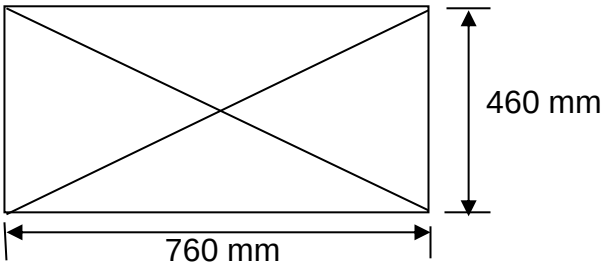

FIGURE 7

[10]

TOTAL 100

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FORMULA SHEET

Any applicable formula may also be used.

1. $A = \pi r^2$
2. $A = \frac{1}{2.} . b. h$
3. $A = \frac{1}{4} . \pi . d^2$
4. $A = L. L$
5. $A = l . b$
6. $f = m. g$
7. $Cos\ \theta = \frac{adjacent}{hypoteneuse}$
8. $Sin\ \theta = \frac{opposite}{hypoteneuse}$
9. $Tan\ \theta = \frac{opposite}{adjacent}$
10. $V = l . b. h$
11. $V = \pi r^2 . h$
12. $V = A. h$
13. $Work\ done = force \times distance$
14. $Force = mass \times gravitational\ force$

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