higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

RIGGING THEORY N2

(11041852)

30 July 2021 (X-paper)
09:00–12:00

Drawing instruments and nonprogrammable calculators may be used.

This question paper consists of 6 pages and 1 formula sheet.

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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. Start each question on a new page.
5. Only use a black or blue pen.
6. Write neatly and legibly.

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QUESTION 1

1.1 Name TWO methods of laying wire ropes. (2)

1.2 State THREE characteristics of each of the following wire ropes:

1.2.1 Seale

1.2.2 Warrington

1.2.3 Reverse lay rope

1.2.4 Non-spin rope

(4 × 3) (12)

1.3 Draw a neat sketch of the 6 mm × 19 mm Seale core in a wire rope. (3)

1.4 Name the wire rope slings in FIGURE 1 below by writing only the name next to the letter (A–C) in the ANSWER BOOK.

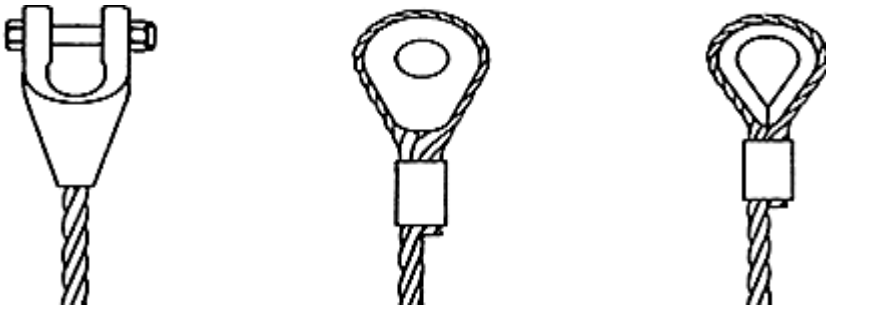


FIGURE 1

(3)
[20]

QUESTION 2

2.1 List SIX safety measures to be considered when operating an air driven winch. (6)

2.2 FIGURE 2 shows a safety harness that you must wear when working at a height of 10 m.

Explain the SEVEN steps in using the safety harness. (7)

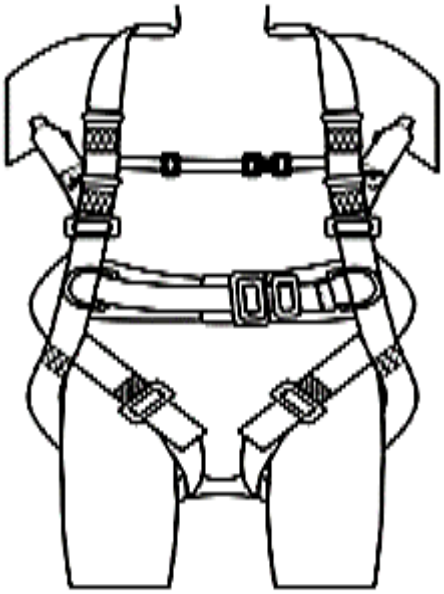


FIGURE 2

2.3 List TWO defects that can occur on the sheave wheel of the snatch block. (2)
[15]

QUESTION 3

3.1 Explain the usage of haulage depression rollers. (4)

3.2 Explain the following terms:

3.2.1 Protection of sheave wheel

3.2.2 Rope support

3.2.3 Corrosion

(3 × 2) (6)
[10]

QUESTION 4

4.1 Name TWO advantages of fitting a balanced rope on Koepe winders. (2)

4.2 State FIVE important factors that need to be considered when erecting a roof over drum winders. (5)

4.3 List FOUR visual inspections that must be done on a single-wrap traction overhead elevator to detect defects. (4)

4.4 List FOUR advantages of single-drum winders. (4)
[15]

QUESTION 5

5.1 Explain the process of detaching a plate grab from a plate and the crane hook. (4)

5.2 List FOUR visual defects on compensating arm device. (4)

5.3 Define the term *safe working load* (SWL)' (2)
[10]

QUESTION 6

6.1 Define the following terms applicable to cranes:

6.1.1 Stability reach

6.1.2 Outreach

6.1.3 Margin of stability

(3 × 2) (6)

6.2 List THREE types of mobile cranes. (3)

6.3 Explain how the tower or mast of the A-frame derrick is set up. (6)

6.4 Explain how to test the brakes on the overhead crane. (2)

6.5 List THREE safety measures that must be considered in preventing a gin pole to collapse when erecting a load. (3)
[20]

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QUESTION 7

7.1 A steel container is used to store rigging equipment.

The dimensions of the container are as follows:

Length = 15 m
Height = 3 m
Width = 3 m
Mass of the rigging equipment = 500 kg

7.1.1 Calculate the total area of the material used to construct the steel container. (6)

7.1.2 Calculate the mass of the material used to construct the steel container if the mass of the steel is 50 kg/m² (3)

7.1.3 Calculate the total mass of the steel container and rigging equipment. (1)
[10]

TOTAL: 100

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FORMULA SHEET

Any other 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. $Force = mass \times gravitational\ force$
15. $P = p \times g \times h$

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