higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

RIGGING THEORY N1

(11041841)

28 November 2019 (X-Paper)
09:00–12:00

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

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
RIGGING THEORY N1
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. Keep ALL subsections of questions together.
5. Write neatly and legibly.

QUESTION 1

1.1 Name TWO types of personal protective equipment a rigger should wear. (2)

1.2 Give THREE instances when safety goggles must be worn to protect the eyes. (3)

1.3 State THREE safety precautions to consider when using a safety belt. (3)

1.4 State TWO safety precautions to consider when using an extension ladder. (2)

1.5 State FIVE safety precautions to consider when working with power tools. (5)

[15]

QUESTION 2

2.1 Give the purpose of each of the following punches used in rigging:

2.1.1 Centre punch

2.1.2 Prick punch

2.1.3 Sleeve punch

(3 × 1) (3)

2.2 Give ONE use of each of the following files used during rigging:

2.2.1 Half-round file

2.2.2 Flat file

2.2.3 Triangle file

2.2.4 Round file

2.2.5 Square file

2.2.6 Hand file

(6 × 1) (6)

2.3 Define each of the following terms regarding heat-treatment processes:

2.3.1 Quenching

2.3.2 Tempering

2.3.3 Flame case-hardening

(3 × 2) (6)

[15]

QUESTION 3

3.1 Define each of the following terms regarding timber:

3.1.1 Brown stain

3.1.2 Bruise

3.1.3 Blue stain

3.1.4 Decay

3.1.5 Ditch

(5 × 1) (5)

3.2 Explain each of the following scaffolding-erecting methods:

3.2.1 Putlog scaffold

3.2.2 Independent scaffold

(2 × 2) (4)

3.3 Draw a neat, labelled sketch of a suspended scaffold. (5)

3.4 Name the type of scaffolding that must be erected so that it can be moved from one point to another point of work. (1)

[15]

QUESTION 4

4.1 FIGURE 1 shows different types of sling eyes.

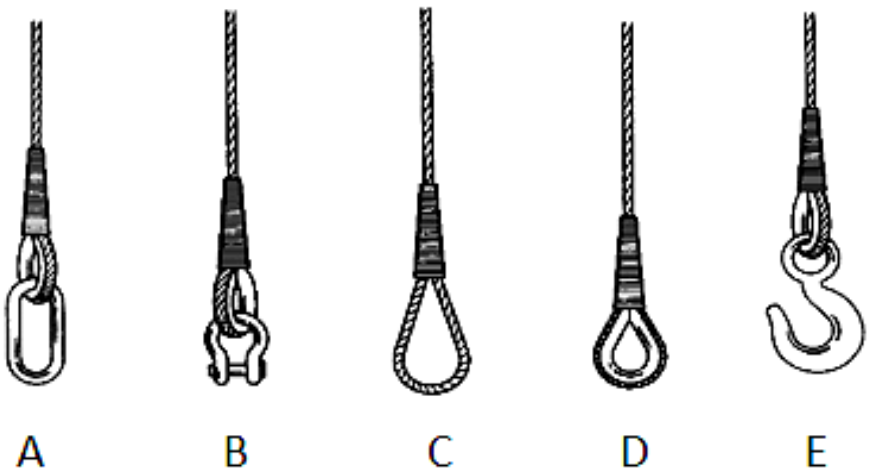

FIGURE 1

Name each type of sling eye by writing only the answer next to the letter (A–E) in the ANSWER BOOK. (5 × 1) (5)

4.2 List FIVE ways to care for slings. (5)

4.3 Slings are marked with an SWL according to the Lifting Equipment Regulation Act as shown in FIGURE 2.

FIGURE 2

4.3.1 What does the abbreviation SWL stand for? (1)

4.3.2 Explain why it is important to have such information stamped on slings. (2)

4.4 Explain the correct body posture to lift up a load. (5)

4.5 State the correct procedure to follow in the event of broken strands on a sling. (2)
[20]

QUESTION 5

5.1 A truck is used to pull a trolley which exerts a steady horizontal pull of 450 N and moving at a rate of 4,5 km/h.

Calculate the work done in 10 minutes. (6)

5.2 Define each of the following mining terms:

5.2.1 Birdcage (2)

5.2.2 Detaching hook (2)

5.2.3 Doubling down (2)

5.2.4 Snatch block (2)

5.2.5 Winch (1)
[15]

QUESTION 6

6.1 Draw a neat sketch of a figure-of-eight knot. (2)

6.2 Explain the purpose of a marline spike hitch. (2)

6.3 Name TWO types of bends used to tie slings. (2)

6.4 List THREE safety conditions required when using oxy-acetylene cutting equipment in a confined space. (3)

6.5 Give TWO disadvantages of the oxy-acetylene process. (2)

6.6 Draw neat sketches of each of the following flames in oxy-acetylene cutting:

6.6.1 Neutral flame

6.6.2 Carbonising flame

6.6.3 Oxidising flame

(3 × 3) (9)

[20]

TOTAL: 100

(11041841)

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. $\cos \theta = \frac{\text{adjacent}}{\text{hypotenose}}$
8. $\sin \theta = \frac{\text{opposite}}{\text{hypotenose}}$
9. $\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$
10. $V = l . b. h$
11. $V = \pi r^2 . h$
12. $V = A. h$
13. $\text{Work done} = \text{force} \times \text{distance}$
14. $\text{Force} = \text{mass} \times \text{gravitational force}$