higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

RIGGING THEORY N1

(11041841)

28 November 2022 (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.

266Q1E2228

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. Use only a blue or black pen.
5. The drawing should be neat and labelled and may be done in pencil.
6. Write neatly and legibly.

QUESTION 1

1.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (1.1.1–1.1.5) in the ANSWER BOOK.

1.1.1 A rigger must wear clear safety goggles when doing gas welding.

1.1.2 All safety signs must be adhered to in the workshop.

1.1.3 Flammable liquids must be kept in the tool storeroom.

1.1.4 A rigger must demarcate the area when a load is suspended in midair.

1.1.5 Always secure the equipment and material to prevent them from falling off the scaffold platform.

(5 × 1) (5)

1.2 FIGURE 1 shows hand signals used during a rigging process. Name the hand signals by writing the answer next to the letter (A–E) in the ANSWER BOOK.

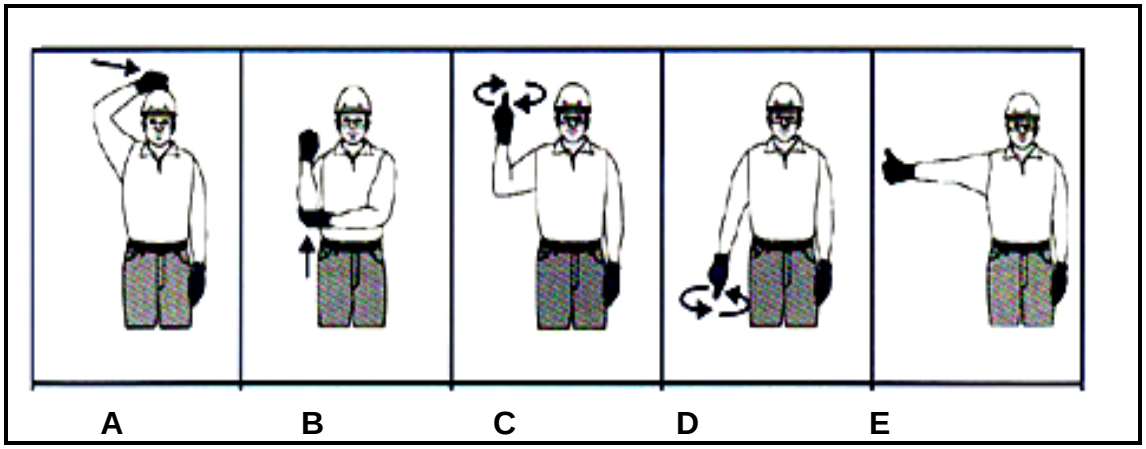

FIGURE 1 (5 × 1) (5)

1.3 State THREE precautionary measures with regard to compressed air. (3)

1.4 State TWO situations where safety goggles must be worn to protect the eyes. (2)

[15]

QUESTION 2

2.1 FIGURE 2 shows different types of profiles. Name each type and write the answer next to the letter (A–E) in the ANSWER BOOK.

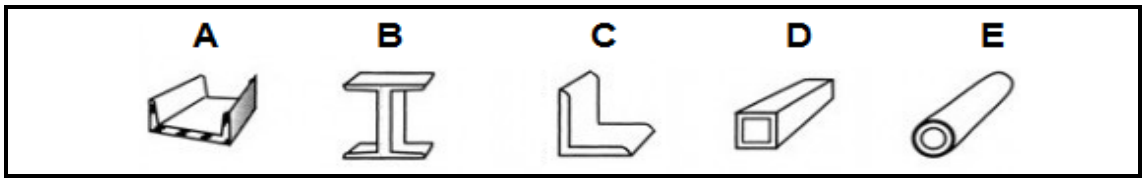

FIGURE 2 (5 × 1) (5)

2.2 Explain the correct procedure of installing the blade onto the hacksaw. (3)

2.3 Draw a neat sketch of a ball-peen hammer and label the parts. (4)

2.4 Define the term *annealing* in the heat-treatment process. (1)

2.5 FIGURE 3 shows two types of chisels (A and B), one is correct and the other one is incorrect.

State which chisel is incorrect and explain the answer.

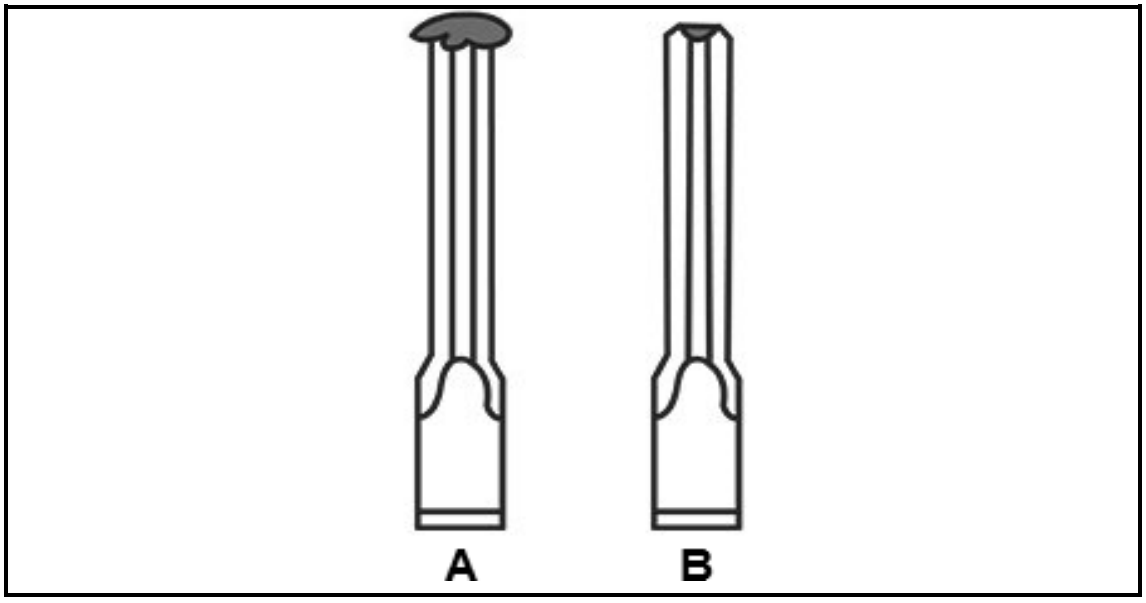

FIGURE 3 (2 × 1) (2)

[15]

QUESTION 3

3.1 Explain what is meant by the following terms with regard to scaffolding:

3.1.1 Base plate

3.1.2 Toe boards

3.1.3 Handrails

(3 × 2) (6)

3.2 State TWO advantages of steel planks. (2)

3.3 Explain the term *suspended scaffold*. (2)

3.4 FIGURE 4 shows defects found in scaffolding planks. Name each defect and write the answer next to the letter (A–E) in the ANSWER BOOK.

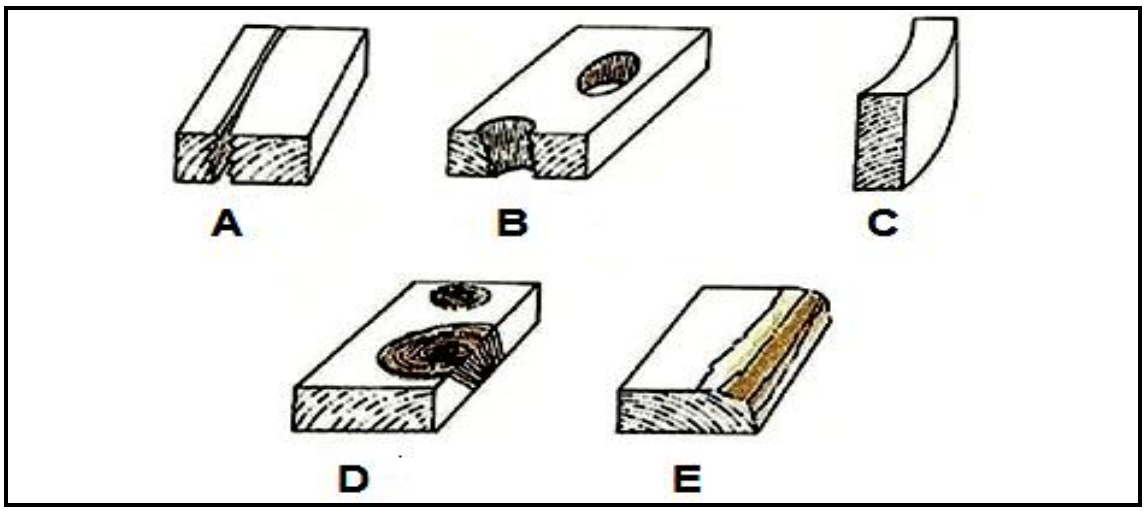

FIGURE 4 (5 × 1) (5)

[15]

QUESTION 4

4.1 Name TWO types of ropes that will give the greatest resistance against crushing. (2)

4.2 Explain how to splice a fibre rope. (4)

4.3 Describe what is meant by *hot-dipped galvanised wire rope*. (2)

4.4 Name FOUR types of natural ropes. (4)

4.5 Describe the effect on a steel wire rope when the pulley groove is undersized. (2)

4.6 Explain what is meant *by pre-forming* and *post-forming* of wire ropes. (6)

[20]

QUESTION 5

5.1 Explain the use of a turnbuckle. (2)

5.2 Calculate the amount of work done in raising a mass of 4 000 kilograms of coal from a mine that is 250 metres deep.

g = 9,81 m/s (6)

5.3 State FOUR advantages of stirrups fitted with loops. (4)

5.4 Name THREE types of couplers. (3)

[15]

QUESTION 6

6.1 Define the term *backfire* during the oxyacetylene cutting process. (2)

6.2 Explain the steps that should be followed to light a cutting torch. (5)

6.3 State ONE purpose of each of the following components of oxyacetylene equipment:

6.3.1 Gas regulator knob

6.3.2 Gas cylinder valves

6.3.3 Gas cylinder trolley

(3 × 2) (6)

6.4 State the purpose of the following bend, knots and hitch:

6.4.1 Butterfly knots (2)

6.4.2 Single Carrick bends (2)

6.4.3 Double Blackwell hitches (1)

6.4.4 Reef knots (2)

[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. $Cos\ \theta = \frac{Adjacent}{Hypotenuse}$
8. $Sin\ \theta = \frac{Opposite}{Hypotenuse}$
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. $Force = mass \times gravitational\ force$