higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

RIGGING THEORY N1

(11041841)

20 April 2021 (X-paper)
09:00–12:00

Nonprogrammable calculators and drawing instruments may be used.

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

262Q1A2120

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. Al the sketches must be large and neat and in good proportion and may be done in pencil.
5. Use only a black or blue pen.
6. Write neatly and legibly.

QUESTION 1

1.1 FIGURE 1 shows different types of hand signals used during the rigging process. Give the meaning of the signals by writing the answer next to the letter (A–J) in the ANSWER BOOK.

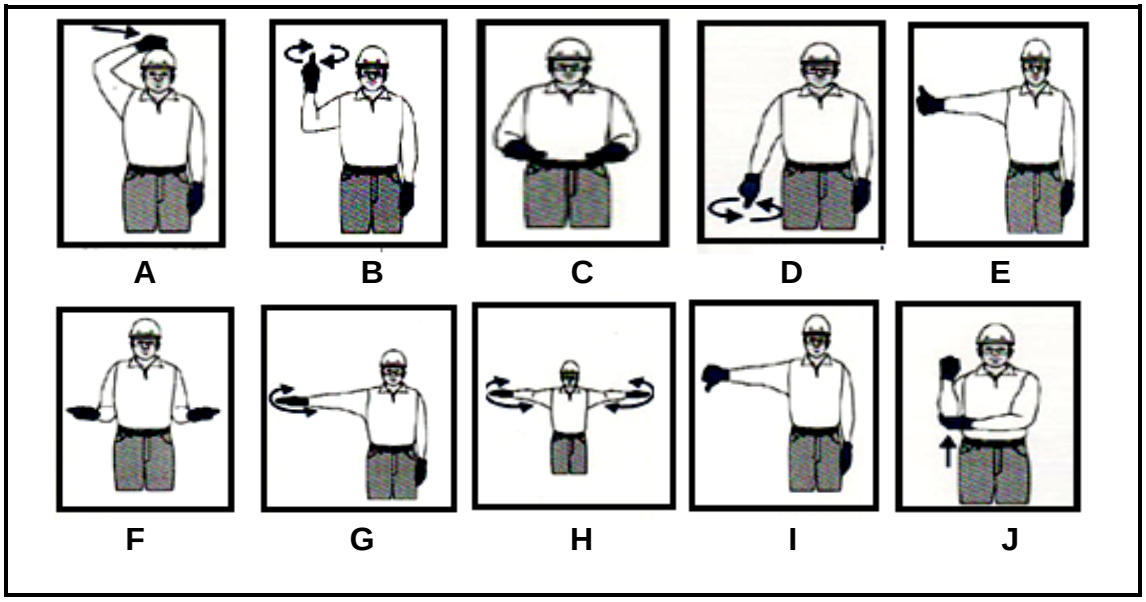

FIGURE 1 (10 × 1) (10)

1.2 State FIVE safety measures of lashing gas cylinders. (5)
[15]

QUESTION 2

2.1 FIGURE 2 shows different types of files used during the rigging process.

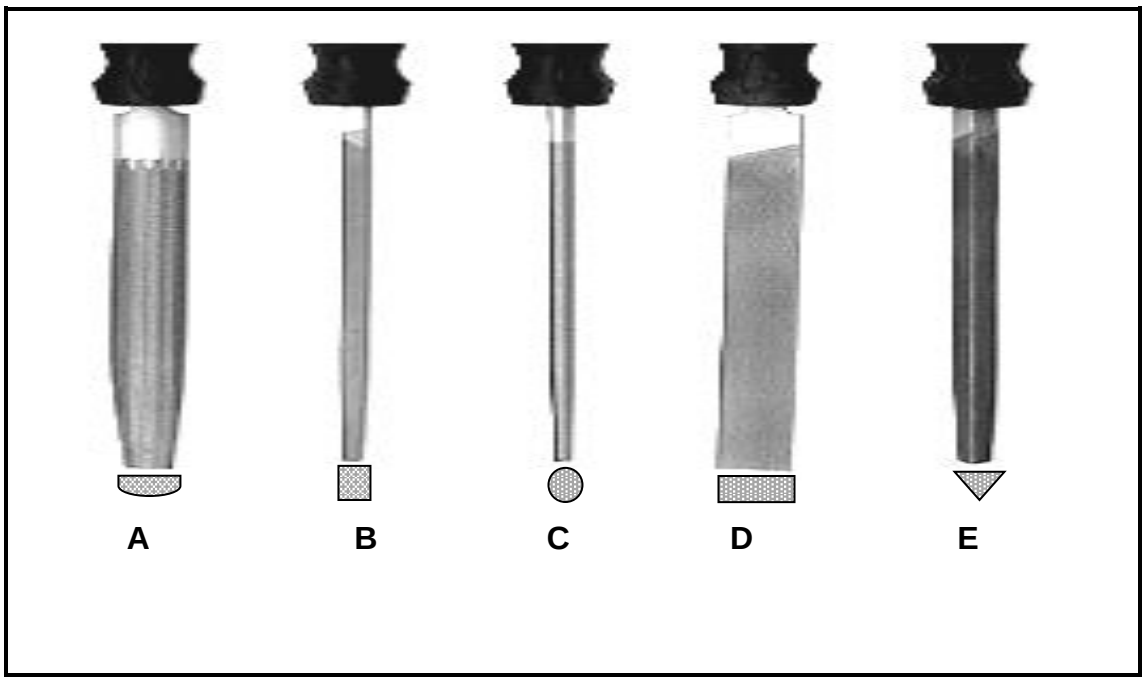

FIGURE 2

2.1.1 Name the rigging files shown in FIGURE 2 by writing the answer next to the letter (A–E) in the ANSWER BOOK. (5)

2.1.2 State ONE function of each file you named in QUESTION 2.1.1. (5)

2.2 Define the term *heat treatment* of metals. (2)

2.3 Name TWO types of heat treatment processes carried out on metals. (2)

2.4 Draw a neat sketch of an H-beam. (1)
[15]

QUESTION 3

3.1 FIGURE 3 shows a suspended scaffold that has been erected from an overhead cantilever support during a rigging process. Name each component indicated on the sketch and write the answer next to the letter (A–G) in the ANSWER BOOK.

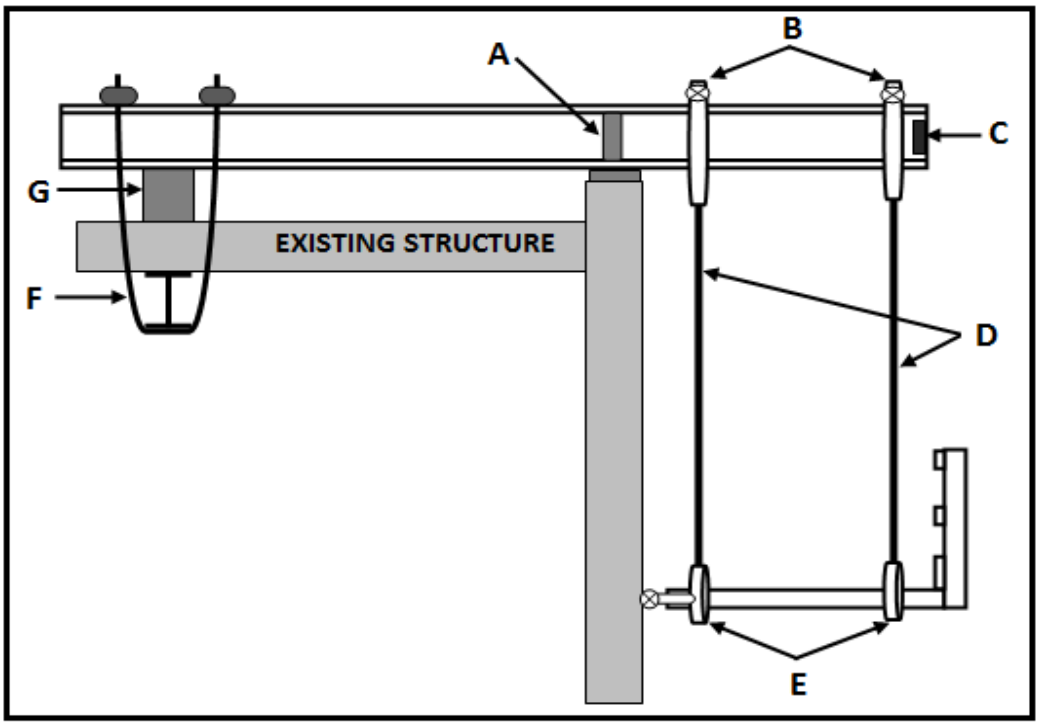

FIGURE 3 (7)

3.2 Draw a neat, labelled sketch of a hop-up bracket used to support a platform for tools and material only. (3)

3.3 Define the term *bruise* that occurs on the timber as a defect. (2)

3.4 State THREE common methods of preserving timber and prolonging its life span. (3)
[15]

QUESTION 4

4.1 A truck is doing 1,250 × 10^3 Nm of work in one minute, when pulling a rope at a speed of 2,45 kilometres per hour.

Calculate the pull that is exerted in one minute. (6)

4.2 State FOUR ways of storing steel wire ropes on a reel. (4)

4.3 Name FOUR types of synthetic fibre ropes used in rigging. (4)

4.4 Explain the process of checking internally and externally for corrosion on a steel wire rope. (4)

4.5 Define the term *lively rope.* (2)

[20]

QUESTION 5

5.1 FIGURE 4 shows different types of slings that are used in rigging.

Name each type of sling by writing the answer next to the letter (A–D) in the ANSWER BOOK.

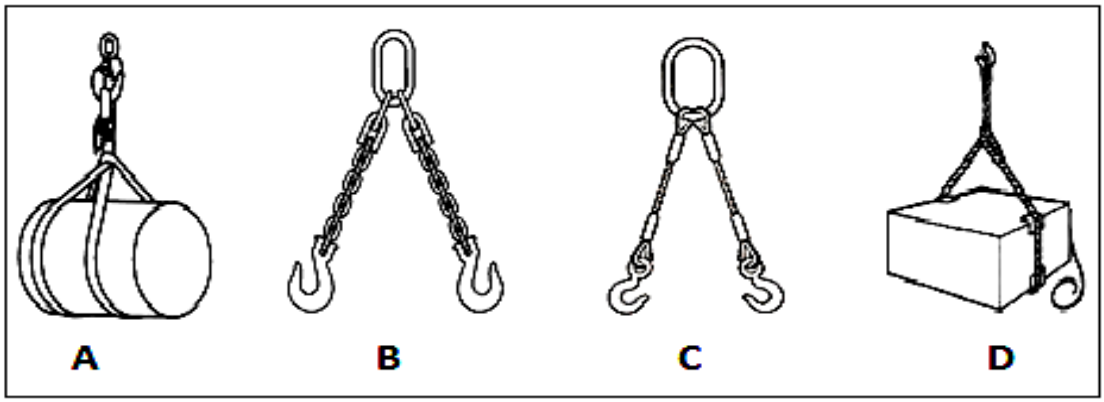

FIGURE 4 (4)

5.2 Give THREE reasons why a part of a rope is wormed, parcelled and served. (3)

5.3 State THREE methods of caring that should be considered during the splicing of ropes. (3)

5.4 FIGURE 5 shows different types of fittings used on slings. Name each type of fitting used on steel rope slings by writing the answer next to the letter (A–E) in the ANSWER BOOK.

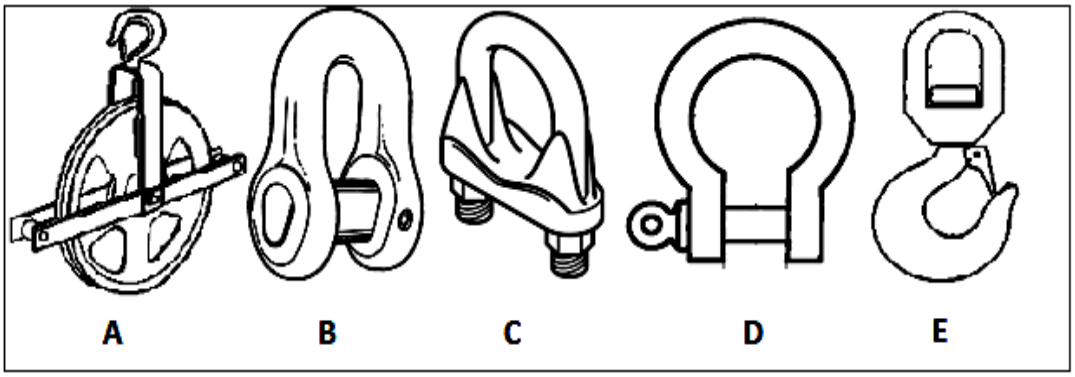

FIGURE 5

(5)
[15]

QUESTION 6

6.1 Name FIVE types of hitches used in ropes. (5)

6.2 Make a neat sketch of a reef knot tied with ropes. (3)

6.3 State ONE function of the components in oxyacetylene equipment:

6.3.1 Flashback arrestors

6.3.2 Gas hoses

6.3.3 Gas cylinders

(3 × 2) (6)

6.4 Explain how gas cylinders must be stored in a storage area. (6)
[20]

TOTAL: 100

(11041841)

FORMULA SHEET

Other applicable formulas 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. $Force = mass \times gravitational\ force$