higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

RIGGING THEORY N2

(11041852)

20 November 2020 (X-paper)
09:00–12:00

Calculators may be used.

This question paper consists of 5 pages.

207Q1E2020

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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 section on a new page.
5. Use only a black or blue pen.
6. Write neatly and legibly.
7.

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QUESTION 1

1.1 List the FOUR types of core's present in wire ropes. (4)

1.2 Name TWO methods of laying a wire rope. (2)

1.3 State FOUR important factors that must be considered to determine when to replace the rope. (4)

1.4 Explain the process that is required to order a steel wire rope. (4)

1.5 Draw a neat sketch of the following core sizes in a wire rope listed below:

1.5.1 (6×7) fibre core (3)

1.5.2 (6×19) fibre core (3)

[20]

QUESTION 2

2.1 FIGURE 1 shows different types of lift equipment used during rigging.

Write the letters (A–C) and name each lifting equipment in the ANSWER BOOK.

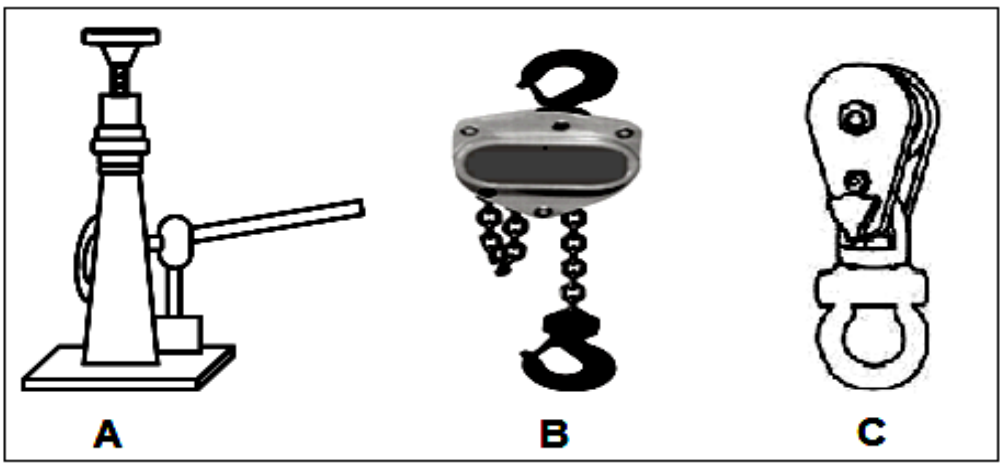


FIGURE 1 (3)

2.2 List FIVE defects that can occur on a ratchet jack. (5)

2.3 Explain how a tirfor winch should be maintained. (4)

2.4 List THREE safety precautions in the storing of lifting equipment for rigging. (3)

[15]

QUESTION 3

3.1 Draw a neat sketch of Haulage Depressing Rollers. (3)

3.2 Explain the following terms:

3.2.1 Guarding of sheave wheels. (2)

3.2.2 Fencing of machinery. (2)

3.3 List THREE points that must be observed during inspection of attachments. (3)

[10]

QUESTION 4

4.1 Explain how a traction elevator works. (6)

4.2 List FOUR advantages of the koepe hoist system of winding. (4)

4.3 Name the TWO main types of elevator roping systems used in South Africa. (2)

4.4 Wire ropes used in connection with scraper haulers or winches must have flexibility, as well as good wearing qualities.

4.4.1 Name the type of core used in this construction. (1)

4.4.2 State TWO reasons for using this type of core. (2)

[15]

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QUESTION 5

FIGURE 3 shows a detaching device used during a lifting process.

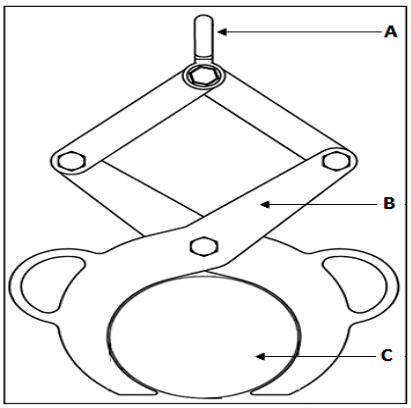


FIGURE 2

5.1 Label the detaching device (A–C) shown in FIGURE 2 in the ANSWER BOOK. (3)

5.2 Name the detaching device shown in FIGURE 2. (1)

5.3 Explain how the detaching device shown in FIGURE 2 should be released. (4)

5.4 Name TWO defects that can occur on the detaching device shown in FIGURE 2. (2)
[10]

QUESTION 6

6.1 FIGURE 3 shows different components (A–F) of an Overhead Crane.
Name each type of component (A–F) of the Overhead Crane in the ANSWER BOOK.

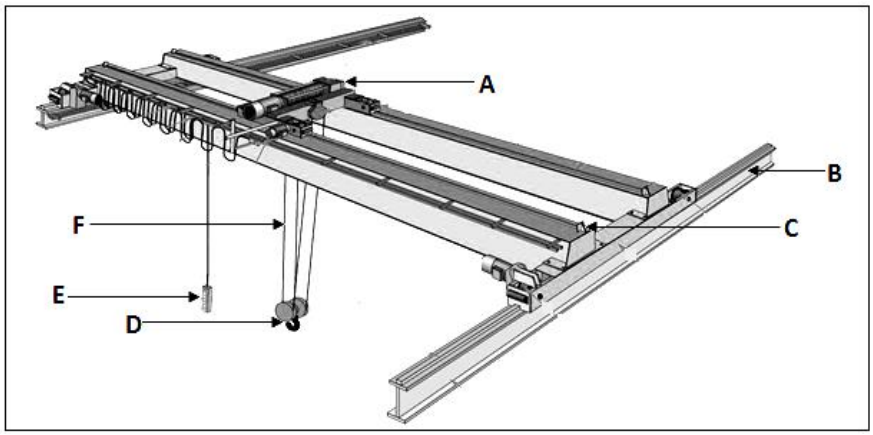


FIGURE 3 (6)

6.2 Define the following terms listed below:

6.2.1 Slewing (1)

6.2.2 Hoisting (1)

6.2.3 Stability base (1)

6.3 Draw a neat sketch of a Stiff-leg Derrick anchor. (3)

6.4 Explain the erecting of an A-frame derrick anchor. (4)

6.5 Name THREE common crane incidents. (3)

6.6 Name ONE defect of a wire rope on the crane. (1)

[20]

QUESTION 7

7.1 A cylindrical tank has a diameter of 2, 5 metres. The depth of the water in the tank is 3metres. Water is pumped from the tank until the depth of the water in the tank is 1.1 metres.

7.1.1 Calulate in cubic metres, the volume of the water that has been pumped out. (7)

7.1.2 Calculate in kilograms, the mass of the water that has been pumped out. The density of the water = 1000kg/m³. (3)

[10]

TOTAL: 100

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(11041852)

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. $Force\ = mass \times gravitational\ force$
15. $M = p\ \times v$

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