higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1580**(E)**(J30)T

NATIONAL CERTIFICATE

RIGGING THEORY N2

(11041852)

30 July 2018 (X-Paper)
09:00–12:00

This question paper consists of 7 pages and 1 formula sheet.

Copyright reserved

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. Keep ALL subsections of questions together.
5. Write neatly and legibly.

Copyright reserved

QUESTION 1

1.1 FIGURE 1 shows different types of wire rope fittings (A–C) in manufacturing slings. Write the letters (A–C) and the name of each rope fitting in the ANSWER BOOK.

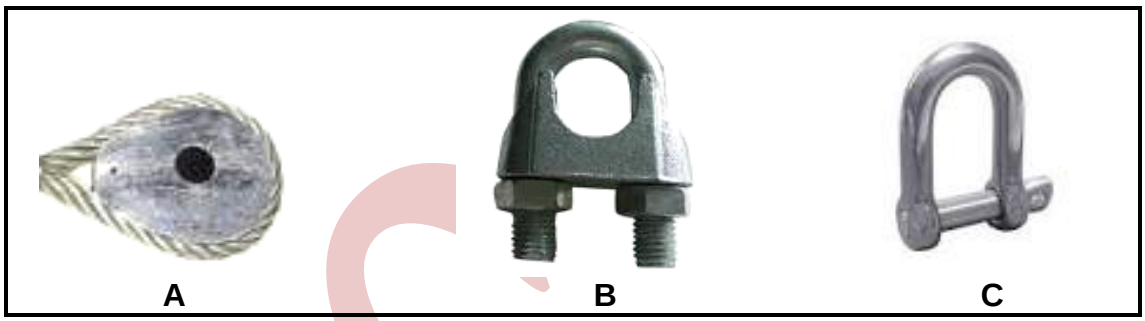


FIGURE 1 (3)

1.2 There are different types of splices used in wire ropes. Explain the purpose of each splice mentioned below:

1.2.1 Eye splice

1.2.2 Back splice

(2 × 2) (4)

1.3 Name SIX main items to be considered when choosing a haulage rope. (6)

1.4 State FIVE main resistance factors to be considered when selecting a rope for a specific job. (5)

1.5 List TWO defects found in fibre ropes. (2)

[20]

Copyright reserved

QUESTION 2

2.1 FIGURE 2 shows different types of jacks used during a rigging process. Write the letters (A–C) and name each type of jack in the ANSWER BOOK.

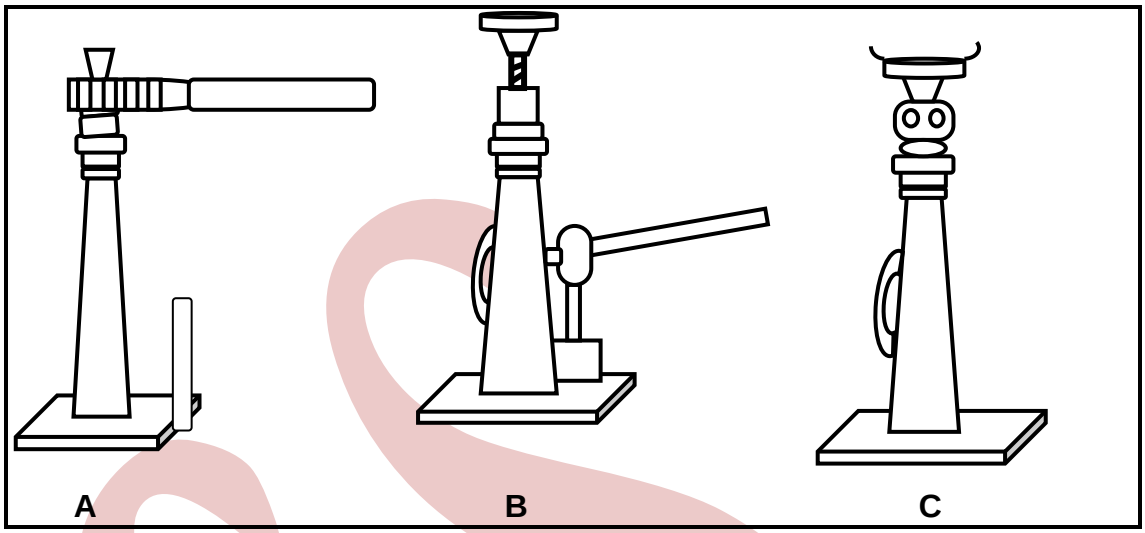


FIGURE 2 (3)

2.2 List FIVE safety inspections that must be carried out before using the safety harness. (5)

2.3 List THREE defects that can occur on a ratchet jack. (3)

2.4 Define a *snatch block*. (2)

2.5 Explain why slings must be protected from sharp corners. (2)

[15]

QUESTION 3

3.1 List FIVE defects that causes the deterioration of haulage ropes. (5)

3.2 Illustrate by means of a neat sketch the layout of haulage depressing rollers. (2)

3.3 Explain why an alloy steel chain attachment should not be annealed. (3)

[10]

QUESTION 4

4.1 List FOUR main categories, mine hoists in South Africa can be divided into. (4)

4.2 Explain how platform winders are for sinking shafts in the following processes:

4.2.1 Construction

4.2.2 Breaking strength

(2 × 3) (6)

4.3 Draw a neat sketch of a 30° progressive groove in traction elevators. (2)

4.4 FIGURE 3 shows different pulleys used on winches. Write the letter (A–C) and next to the letters the name of each pulley in the ANSWER BOOK.

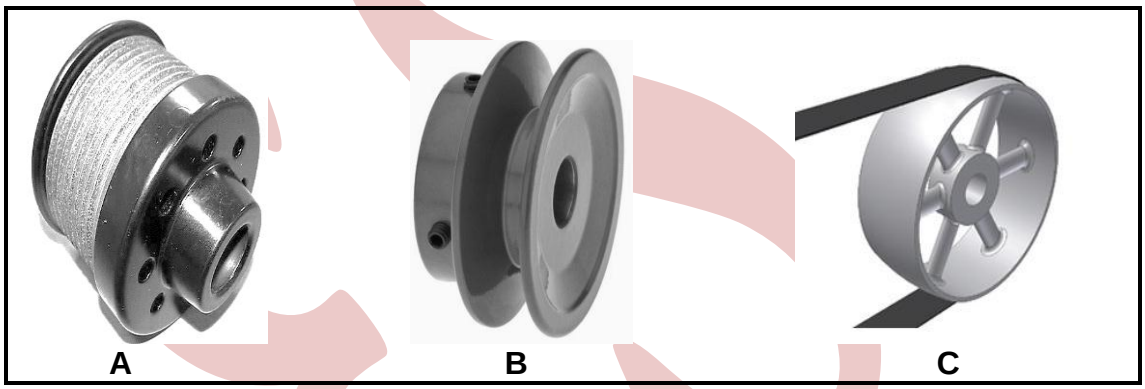


FIGURE 3 (3)

[15]

QUESTION 5

5.1 FIGURE 4 shows a detachable device. Write the letters (A–C) and next to the letters the name of each part in the ANSWER BOOK.

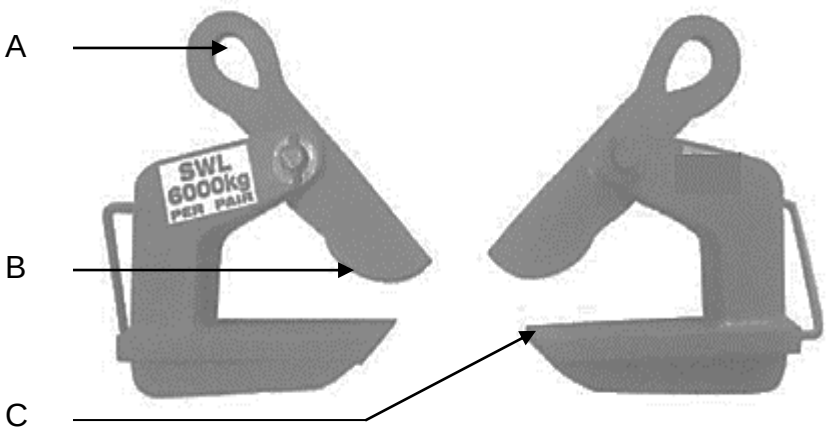


FIGURE 4 (3)

5.2 Name the detachable device shown in QUESTION 5.1. (1)

5.3 Explain the operation of the detachable device shown in QUESTION 5.1. (5)

5.4 What does the acronym SWL stand for shown in QUESTION 5.1? (1)
[10]

QUESTION 6

6.1 Define the following terms apllicable to mobile cranes which a operator or rigger must be familiar with:

6.1.1 Radius

6.1.2 Outreach

6.1.3 Slewing

(3 × 2) (6)

6.2 Explain where the following types of anchors would preferably be used:

6.2.1 Guy anchor

6.2.2 Double-staking anchor

(2 × 2) (4)

6.3 Name FIVE advantages of mobile cranes. (5)

6.4 State FIVE safety precautions when using a locomotive crane to lift a load. (5)
[20]

Copyright reserved

QUESTION 7

7.1 FIGURE 5 show a solid round bar weighing at 80 kg/m² and the length of 5 metres.

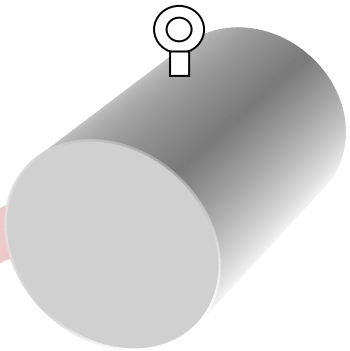


FIGURE 5

Calculate the mass of the solid round bar with a diameter of 200 mm. (5)

7.2 FIGURE 6 shows a closed square container that is used to store lifting equipment.

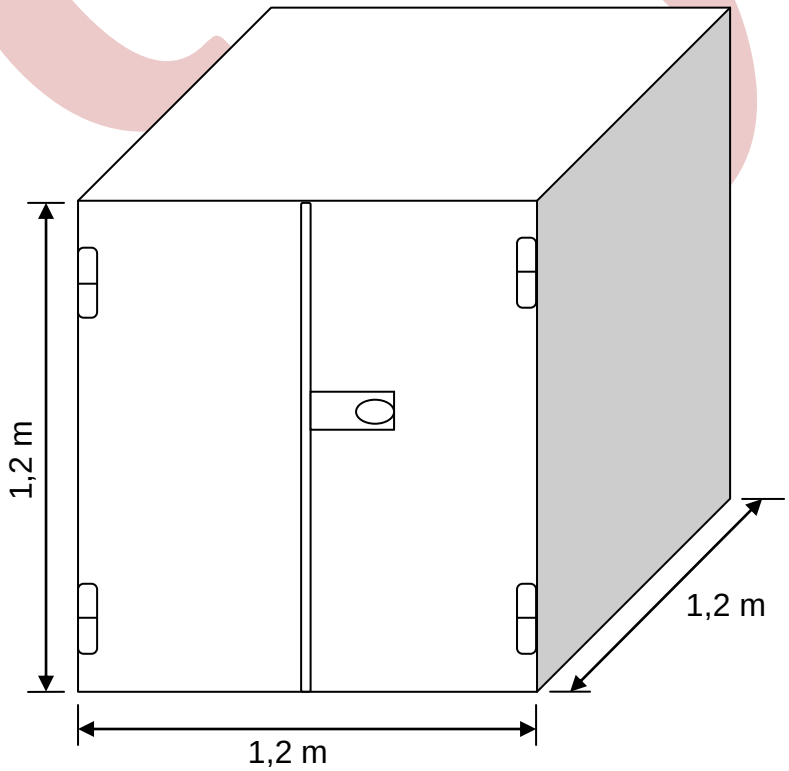


FIGURE 6

Calculate the volume of the container. (5)
[10]

TOTAL: 100

Copyright reserved

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.. $A = l.b$
5. $f = m.g$
6. $Cos\,\theta = \frac{Adjacent}{Hypoteneuse}$
7. $Sin\ \theta = \frac{Opposite}{Hypoteneuse}$
8. $Tan\,\theta = \frac{Opposite}{Adjacent}$
9. $V = l.b.h$
10. $V = \pi r^2.h$

Copyright reserved