higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

RIGGING THEORY N1

15 April 2020

This marking guideline consists of 6 pages.

Copyright reserved

QUESTION 1

1.1
1.1.1 A
1.1.2 C
1.1.3 C
1.1.4 A
1.1.5 A
1.1.6 C
1.1.7 C
1.1.8 D
1.1.9 C
1.1.10 A

(10 × 1) (10)

1.2
- Ensure the area around you where work has to take place is properly demarcated.
- Ensure the relevant tools are secured to prevent them from falling.
- Ensure the relevant safety equipment is used when working at heights.
- Ensure emergency assistance is available where the work has to take place.
- Ensure proper ventilation and lighting is available in confined spaces.
- Ensure a lifeline is tied to the person that is carrying out the job and fellow worker is standing outside the confined area. (Any 5 × 1) (5)

[15]

QUESTION 2

2.1 2.1.1
A – Hammer or ball peen hammer
B – Flat screwdriver
C – Rubber mallet
D – Shifting spanner or adjustable spanner (4)

2.1.2 Hammer or ball pen hammer
- Always be kept clean and dry when not in use to prevent damage to handle and corrosion.
- Ensure the head is firmly fixed to the handle to prevent any incidents or accidents.
- Ensure the handle is not cracked or damaged.

Flat screwdriver
- Ensure the screwdriver is not used as a chisel or a lever.
- Ensure that they are not lying around untidily, must be kept on a proper shelve or tool box.
- Use the correct screwdriver for the correct job.

Rubber mallet
- Always be kept clean and dry when not in use to prevent damage to handle.
- Ensure the rubber head is firmly fixed to the handle to prevent any incidents or accidents.
- Ensure the handle is not cracked or damaged.

Copyright reserved

Shifting spanner or adjustable spanner
- Keep shifting spanners in a dry place to prevent rust.
- Ensure the shifting spanner are hanged correctly and not over other tools.
- Do not mishandle or misuse the shifting spanner. (Any 4 × 1) (4)

2.2 2.2.1
- Can be case hardened
- Malleable
- Soft and ductile (Any 2 × 1)

2.2.2
- Can be hardened
- High strength and toughness

2.2.3
- Wear resistant
- Shock resistant
- Very hard (Any 2 × 1)
(3 × 2) (6)

2.3



UNEQUAL ANGLE IRON ✓ (1)
[15]

QUESTION 3

3.1 3.1.1 Brace is a diagonal tie to prevent distortion and collapsing of the structure. (1)

3.1.2 Bracket scaffold is supported by means of ropes passing over the ridge and secured with hooks to the ridge of the roof. (2)

3.1.3 End check is a separation along the grain of a pole and across the annual rings and extending to the end of the plate. (1)

3.1.4 Guard rail is a safety rail to prevent a person from falling. (1)

3.1.5 Hop-up brackets are cantilever brackets attached to the standards at intermediate heights to support a platform for tools and material only. (2)

Copyright reserved

3.2 Use the existing structure to provide support for the row of standards.✓ Use base plates, ties, clamps and other components to erect the scaffold and then secure them against the existing structure.✓ Secure the scaffold by bracing where necessary.✓ Use scaffold planks to form the platform and guard rails for the safety of a person and mount the toe-boards on the platform to prevent tools or material from falling.✓ Erect a stair on an appropriate side of the scaffold for easy access to the platform.✓ (5)

3.3 Retrieve the wooden scaffold plank from the storage area to carry out a jump test.✓ Place the plank on two 150 mm fulcrums.✓ Climb on top of the plank and jump a few times which will cause an impact on the plank.✓ (3)
[15]

QUESTION 4

4.1 To order a steel wire rope one must specify the length of the rope required in millimetres, centimetres or metres.✓ A person must specify the diameter or in some cases the circumference of the rope in millimetres (i.e: 17 mm dia).✓ A person must specify the number of strands✓ and the number of wires per strand [i.e: 6 × 24 (19.9.F)].✓ (4)

4.2 4.2.1 Corrosion is the wearing or rusting of wire strands internally or externally in the steel wire rope due to rubbing on structure and stored in wet conditions.

4.2.2 Wire fatigue is the wearing or breaking of wire strands internally or externally in the steel wire rope.
(2 × 2) (4)

4.3
- Natural vegetable fibre ropes
- Synthetic fibre ropes (2)

4.4
- Check rope fittings are not damaged and are properly secured.
- Check for any wear on the fibre ropes.
- Check if here is any tear on the rope.
- Check for any knots tied on the rope.
- Check for any broken strands on the rope.
- Check for any burns due to chemical hazards and open flames on the ropes. (Any 4 × 1) (4)

4.5 Force = m × g✓
= 520 kg × 9,81 m/s✓
= 5101,2 Newton's✓

Work done = force × distance✓
= 5101,2 N × 150 m✓
= 765180 Joules✓ (6)
[20]

Copyright reserved

QUESTION 5

5.1
Step 1: Tuck A, from right to left, under the nearest strand of the standing part.
Step 2: Tuck B, from right to left, under the next strand of the standing part.
Step 3: Turn the rope over so as to bring the remaining strand C on the top and then tuck C from right to left under the unoccupied strand of the standing part.
Step 4: Beginning with C, heave each strand taut with a heaving mallet then tuckall three strands a second and third time.
Step 5: Finish of by tapering the splice. (5)

5.2 5.2.1
- Wire strands broken.
- Kinks on the slings.
- Corrosion on the slings.
- Wear on the slings.
- Lacking lubrication on the core of the sling. (Any 3 × 1)

5.2.2
- Tearing of fibres on a sling.
- Damaged sling fittings.
- Knots on the sling.
- Burns on the sling.
- Hazardous substances damages slings. (Any 3 × 1)

(2 × 3) (6)

5.3
A – Swivel link
B – Sliding hook
C – Crosby clamp
D – Drop forged open socket (4)

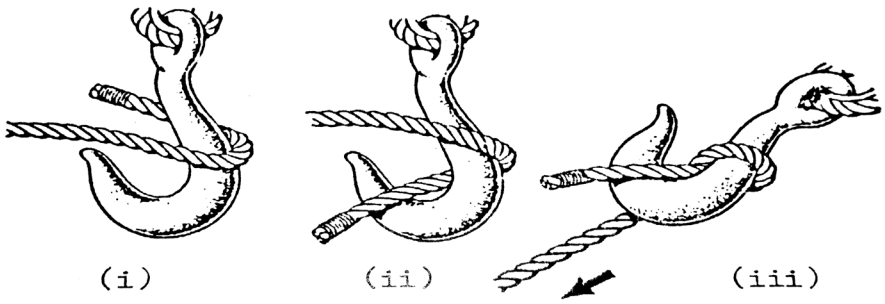
[15]

QUESTION 6

6.1
- Reef knot
- Bowline knot
- Figure-of-eight knot
- Overhand knot
- Single knot.
- Butterfly knot.
- Fisherman's knot
- Middleman knot (Any 5 × 1) (5)

Copyright reserved

6.2



(3)

6.3 Open gas cylinder valves and set the gas regulators to the required pressure.✓ Open the acetylene valve on the torch and light up using a spark lighter.✓ The flame will be a carburising flame.✓ Open the oxygen valve on the torch and the flame will change to an oxidising flame.✓ Turn the oxygen valve further until the cone is small which is set to a neutral flame.✓ (5)

6.4
- Acetylene gas is very explosive and flammable
- Much slower than any other cutting process (2)

6.5
- Incorrect pressure
- Distorted or loose tips
- Failure to purge the system
- Kinked hoses
- Blocked tips
- Torch orifices
- Overheated tip (Any 4 × 1) (4)

6.6 The content pressure gauge indicates the amount of gas in the cylinder. (1)

[20]

TOTAL 100

Copyright reserved