higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

RIGGING THEORY N1

5 December 2023

This marking guideline consists of 8 pages.

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QUESTION 1

1.1 1.1.1 Safety goggles – protect the eyes from any hazards

1.1.2 Ear plugs – protect the ears from load noise, dust or excessive wind

1.1.3 Safety harness – prevents a person falling from heights

1.1.4 Leather spats – prevents sparks from entering the safety boots.

1.1.5 Dust mask – prevents the inhalation of dust or dust particles.

(5 × 1) (5)

1.2
- Ensure that there are no open wires on the electrical equipment.
- Check whether the equipment has an emergency switch.
- Do not wear any jewellery which can be a hazard when working with electrical equipment.
- Inspect the equipment for any defects before use.
- Ensure that plugs and connectors are properly earthed.
- Ensure that the relevant safety equipment is worn before using electrical equipment. (Any 5 × 1) (5)

1.3
- Check the area and the tanks for any leaking gases.
- Always have a fire extinguisher close at hand in case of a fire.
- Ensure that the person working in the confined space is wearing proper personal protective clothing and respiratory mask.
- Check whether the area is well ventilated.
- Ensure to tie a rope on the person working in the confined space.
- Ensure no smoking or open flames.
- Always have a person standing outside in case of emergency situations.

(Any 5 × 1) (5)

[15]

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QUESTION 2

2.1
- Large tapered spike
- Small tapered spike
- Flat spike
- Large T-needle spike
- Small T-needle spike (Any 2 × 1) (2)

2.2
- The large tapered spike is used mainly in large slings for eye and short splicing.
- The small tapered spike is used in much smaller slings for eye and short splicing.
- The flat spike is used for longer splicing.
- The large T-needle spike is used to assist in large slings or ropes during long splicing.
- The small T-needle spike is used to assist in small slings or ropes during short splicing. (Any 2 × 1) (2)

2.3 2.3.1 Shifting spanner (1)

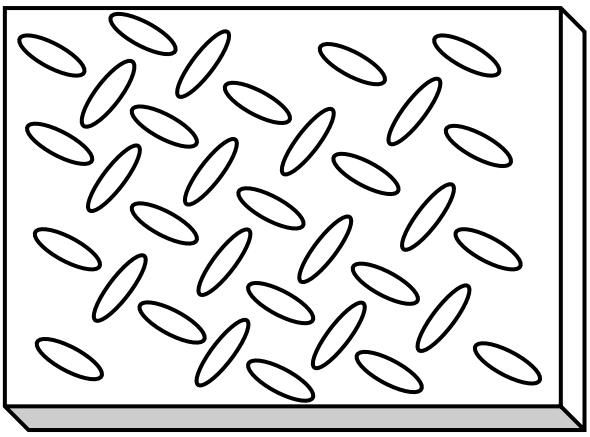
2.3.2 Claw hammer (1)

2.3.3
- A shifting spanner can be adjusted and is used to loosen or tighten nuts and bolts.
- A claw hammer is used to strike objects (e.g. nails, screws).
- A claw hammer is also used to remove nails or screws. (2)

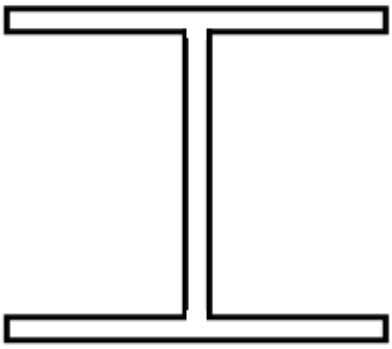
[8]

QUESTION 3

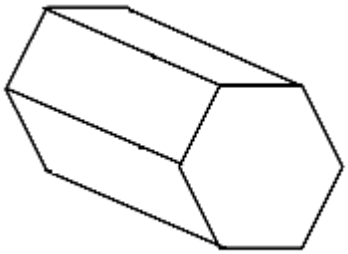
3.1



3.2



3.3



(3 × 2) **[6]**

QUESTION 4

4.1 4.1.1 A brace is a diagonal tie✓ to prevent the structure from collapsing and distorting.✓

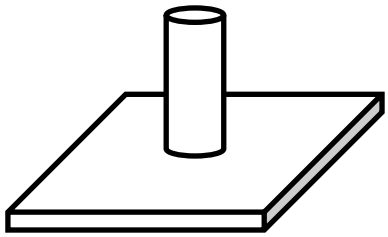
4.1.2 Toe boards are mounted of top of a platform✓ of a scaffold to prevent any material or tools from falling.✓

4.1.3 A cradle is a frame for supporting suspended platforms✓ or other similar scaffold. It sometimes incorporates a winch.✓

4.1.4 A guard rail is a safety rail✓ and is used for preventing a person from falling✓ from a scaffold.

(4 × 2) (8)

4.2



✓✓ (2)

[10]

QUESTION 5

5.1
- Hardwood.
- Softwood.

(2)

5.2 5.2.1 The use of coal tar is advantageous as it treats and protects timber.

5.2.2 Water-repellent paint is used to preserve wood against weather conditions. Mostly used on pallets.

5.2.3 Zinc sulphate is diluted and then used on timber which is protected from fungi, vermin and termites.

(3 × 1) (3)

[5]

QUESTION 6

6.1 $(a)\ F = m.g$√
= 500 kg × 9.81m/s√
= 4905 N√

$(b)\ W = F \times distance$√
□□□= 4905 N × 24 m√
= 117720 Nm√ (6)

6.2 6.2.1 A nylon web sling is made of a special woven synthetic rib.√ It is designed for vertical tensioning√ and the material is wear proof.√ (3)

6.2.2 Nylon of ethylene (2)

6.3 Post-formed wire ropes are obtained by putting rope over several rollers.✓ Rollers are placed before a matrix.✓ It releases stress in individual wires and also releases tension on the rope.✓ (3)

6.4
- Consider breaking forces and mass of the rope.
- Consider safety factors.
- Consider the size of the sheaves and drums.
- Consider the stresses when bending is taking place.
- Consider the safe working load of the rope.
- Consider the reserved strength of the rope. (Any 5 × 1) (5)

6.5 Working load limit (1)
[20]

QUESTION 7

7.1 A. Eye-to-eye turnbuckle
B. Rigging-screw turnbuckle (2)

7.2 Rigging screws have a closed barrel type centre.✓ Ensure that the locking nuts are released before setting the rigging screw turnbuckle.✓ Insert a tommy bar in the groove and rotate the barrel to loosen or tighten the rope.✓ (3)
[5]

QUESTION 8

8.1

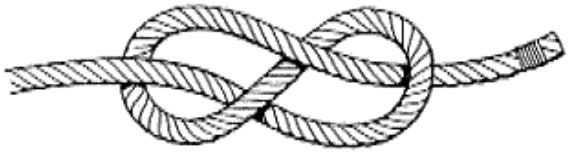


Figure Eight Knot ✓✓ (2)

8.2 For lashing long bundles such as sails, hammocks and awnings. In each hitch the end is passed down through the bight, thus jamming that part against the bundle and enabling the lashing to be hauled taut. The operation of binding together ropes or yarns by a succession of closely spaced marling hitches is known as marling down. (2)

8.3
- Carrick bend
- Double Carrick bend
- Howser bend
- Sheet bend
- Fisherman's bend (Any 2 × 2) (4)

[8]

QUESTION 9

9.1 9.1.1 A back splice
- Is used to finish the end of the rope
- Rope that cannot be laced through a block
- Prevents wire ends from loosening (Any 2 × 1) (2)

9.1.2 Eye splice is:
- To make a permanent eye.
- Found at the end of the ropes. (2)

9.1.3 Short splice is:
- To tie two fibre ropes together
- To tie steel wire ropes together (2)

9.2
- Chain slings are heavier than any other slings.
- Chain slings are very expensive.
- Chain slings are not easy to transport.
- Chain slings are difficult to use in confined spaces.
- Chain slings have links joined together so it is unsafe when it snaps, compared to wire rope slings that have strands. (Any 4 × 1) (4)

[10]

QUESTION 10

10.1
A Cylinder pressure gauge
B Connection to cylinder
C Regulator
D Regulator adjusting lever
E Connection to gas hoses
F Working pressure gauge (6)

10.2
A. Carburizing flame
B. Oxidizing flame
C. Neutral flame (3)

10.3
- Oxide on the surface
- Flakes
- Oil and grease
- Paint
- Rust
- Solvents (Any 4 × 1) (4)

[13]

TOTAL: 100

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