higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

RIGGING THEORY N1

11 August 2021

This marking guideline consists of 6 pages.

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QUESTION 1

1.1

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

(10 × 1) (10)

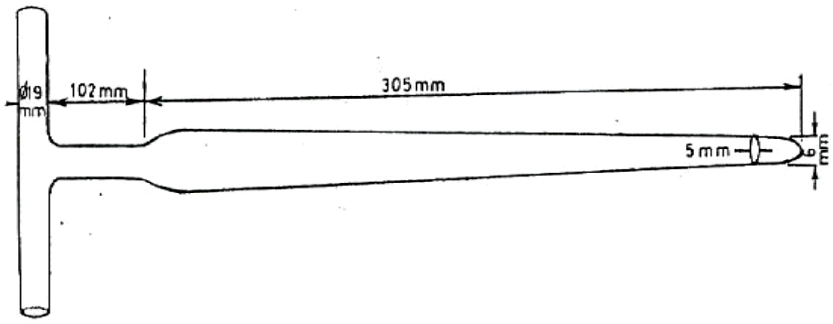
1.2
- No sparks or flames should be allowed close to tanks
- The area should be well ventilated (2)

1.3
- The tail line must be fastened to a secure place.
- The tail line must be free from obstructions or possible damage.
- The safety belt must be securely fastened around the waist.
- Safety belts are essential for any off-ground work. (Any 3 × 1) (3)

[15]

QUESTION 2

2.1



✓✓ (2)

2.2
- The ball peen hammer should always be kept clean and dry when not in use to prevent damage to the handle and corrosion to the head.✓
- One should ensure that the head is firmly fixed to the handle to prevent any incidents or accidents.✓
- One should ensure that the handle is not cracked or damaged.✓



✓ (4)

2.3 2.3.1 Ferrous metals contain iron and will be attracted by a magnet.✓✓

2.3.2 Non-ferrous metals contain none or very little iron and will not be attracted by a magnet.✓✓

(2 × 2) (4)

2.4
- Copper
- Aluminium
- Lead (Any TWO or other relevant answers) (2)

2.5 2.5.1 B
2.5.2 F
2.5.3 J

(3 × 1) (3)
[15]

QUESTION 3

3.1 A scaffold is a temporary structure onto which a platform is placed.✓ A scaffold is made up by joining a series of metal tubes to from a rigid structure.✓ Sometimes scaffolds are made from wood.✓ (3)

3.2 3.2.1 Pipes and couplers
The scaffolding coupler is a kind of device which is usually used to hold two pieces of a scaffolding structure together.✓ It is always used in the joints where two or more pipes come together. The main function of a scaffolding coupler✓ is to connect different pieces tightly to together to prevent the scaffolding from moving or slipping.✓ (3)

3.2.2 Clamps and tubes
Tube and clamp scaffolding is a versatile type of scaffolding which consists of steel tubes and clamps.✓ Vertical tubes are connected to horizontal tubes✓ at right angles.✓ (3)

3.2.3 Footplates or base jack
A base jack or foot plate is load-bearing✓ base✓ for a scaffold. (2)

3.3
- Oregon
- South African Pine
- Laminated South African pine
- Douglas pine (4)

[15]

QUESTION 4

4.1

NATURAL VEGETABLE FIBRE ROPE	SYNTHETIC FIBRE ROPE
1. A natural rope is a rope made from natural fibres sourced from plants.✓ 2. Natural ropes are susceptible to rotting, degrading and mildew/fungus.✓ 3. They wear out very quickly.✓	1. Synthetic ropes are made from nylon, polyester, polypropylene or high-performance fibres.✓ 2. Nylon ropes are strong and has elastic stretch properties.✓ 3. Nylon absorbs water and is weaker when wet.✓

(3 × 2) (6)

4.2 4.2.1 Manilla

Manilla is obtained from the abaca (wild banana) plant.✓ All manila fibre rope manufacturing processes consists of twisting fibres into yarns and turning the yarns in opposite directions to establish the strands.✓ Ropes may be of a right-hand lay or left-hand lay, but the most common is right-handed. It is essential to realise that each of the components is turned (twisted) up in an opposite direction to that of its predecessor. E.g., in a right-hand lay, strands are laid up right-handed (clockwise), yarns are laid up left-handed and fibres are laid up right-handed.✓ (3)

4.2.2 Sisal

All Sisal fibre rope manufacturing processes consists of twisting fibres into yarns and turning the yarns in opposite directions to establish strands.✓ Ropes may be of a right-hand lay or left-hand lay, but the most common is right-handed. It is essential to realise that each of the components is turned (twisted) up in an opposite direction to that of its predecessor.✓ E.g., in a right-hand lay, strands are laid up right-handed (clockwise), yarns are laid up left-handed and fibres are laid upright-handed. Sisal ropes are obtained from the leaves of the Agave sisalana plant, a large plant in the cactus family.✓ (3)

4.3 All nylon rope is on average 16% weaker when wet than when dry. However, when new and dry, they are the best ropes for applications like high lines where high strength is required.✓ Polypropylene ropes are actually stronger wet than dry.✓ (2)

4.4 4.4.1 Pre-forming

- Wires and strands are set to a pattern beforehand.
- Prevents the natural tendency of ropes to straighten.
- Can be cut without clamping. (3)

4.4.2 Post-forming

- Obtained by putting rope over seven rollers. Rollers can be placed before the matrix.
- Removes stress in individual wires.
- Tension can be relieved by giving rips quarter turns. (3)

[20]

QUESTION 5

5.1
- Thimbles are used to protect the eyes of cable✓ and rope slings from abrasion by providing a solid steel barrier between the fragile cable✓ strands and the other rigging fittings used in the connection.✓
- Thimbles also prevent eye deformation or kinking by giving structure to the cable eye.✓
- After repeated load use, wear and kinking can reduce the strength of the cable and can lead to premature failure.✓ (5)

5.2
- Flat wire roll slings
- Canvas slings
- Nylon rib canvas slings (3)

5.3
- To finish off the ends of a rope.
- To ensure that ropes can be laced through a block.
- To prevent wire ends from loosening. (3)

5.4

WIRE ROPE	CHAIN ROPE
This structure provides strength, flexibility, and the ability to handle bending stresses.✓ When it comes to toughness and dependability ✓	Chain slings can be used to lift very heavy and bulky loads on a regular or repetitive basis.✓ Their flexible design provides strength and durability so they can withstand impact and extreme temperatures.✓

(4)
[15]

QUESTION 6

6.1 6.1.1 CLOVE HITCH
Clove hitch is used to tie rope to a pipe and a host of other things without slipping.✓✓

6.1.2 REEF KNOT
A reef knot is an ancient and simple binding knot used to secure a rope or line around an object.✓ The knot is formed by tying a left-handed overhand knot and then a right-handed overhand knot, or vice versa.✓

(2 × 2) (4)

6.2
- Carrick bend✓✓
- Double Carrick bend✓✓
- Howser bend
- Sheet bend
- Fisherman's bend (Any TWO or other relevant answers) (2 × 2) (4)

6.3 A – Working pressure gauge
B – Pressure content gauge
C – Right-hand threaded nut
D – Inlet pipe
E – Outlet swivel
F – Regulator knob (6 × 1) (6)

6.4 Flashback arresters are used to prevent a reverse flow of oxygen into the fuel gas hose (or fuel into the oxygen hose),✓ producing an explosive mixture within the hose.✓ The flame can then burn back through the torch, into the hose and may even reach the regulator and the cylinder. Flashbacks can result in damage or destruction of equipment and could even cause the cylinder to explode.✓ (3)

6.5 Flashback arresters must be fitted to both the oxygen and fuel gas hoses near to the regulators.✓ Non-return valves (often called check valves) should be fitted on the torch✓ to prevent back feeding of gas into the hoses. For long lengths of hose, arresters should be fitted on both the torch and the regulator.✓ (3)
[20]

TOTAL: 100

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