higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

RIGGING THEORY N1

28 November 2022

This marking guideline consists of 5 pages.

QUESTION 1

1.1
1.1.1 False
1.1.2 True
1.1.3 False
1.1.4 True
1.1.5 True

(5 × 1) (5)

1.2
A – Use main hoist
B – Use whipline
C – Hoist
D – Lower
E – Raise boom (5)

1.3
- Do not leave compressed air valves open after use.
- Beware of hoses running across the floor.
- Do not fool around with compressed air. (3)

1.4 Use goggles when:
- grinding with any type of grinder.
- working with a drilling machine.
- working with a chisel.
- working with compressed air.
- doing gas welding and gas cutting. (Any 2 × 1) (2)

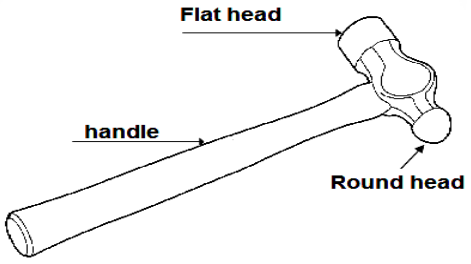
[15]

QUESTION 2

2.1
A – Channel iron
B – I-beam
C – Angle iron
D – Square tubing
E – Round pipe (5)

2.2
- Loosen the wing nut at the end of the hacksaw frame.
- Install the blade and ensure the teeth are facing away from the handle of the hacksaw.
- Tighten the wing nut at the end and ensure the blade is secure. (3)

2.3



(1 mark for drawing, 3 marks for labelling) (4)

2.4 Carbon steel is softened by the annealing process in order to facilitate the machining processes. (1)

2.5
- A is incorrect
- The 'mushroom head' on the chisel was caused when the chisel was hit so much that the head got deformed and now looks like a mushroom. (2)

[15]

QUESTION 3

3.1 3.1.1 A base plate is a foot plate where the scaffold pipes are inserted at the bottom.

3.1.2 Toe boards are boards placed on the platform to prevent tools or equipment from falling off the platform.

3.1.3 Handrails are railings that prevent equipment and employees from falling from the platform of the scaffold or structure.

(3 × 2) (6)

3.2
- More robust and clamps on the scaffold pipe.
- Much safer to use.
- Has a rough surface for grip. (Any 2 × 1) (2)

3.3
- Suspended scaffolds are platforms suspended by ropes or other non-rigid means from an overhead structure.
- Two-point scaffolds are the most common type of suspended scaffold. (2)

3.4 A – Split in the plank
B – Knot holes
C – Bent plank
D – Knots
E – Wane (5)

[15]

QUESTION 4

4.1
- Rope of equal lay
- Seal filler wire
- Warrington-seal type rope (6 × 25) (Any 2 × 1) (2)

4.2
- Ends to be finished off. Rope with a diameter of 75 mm each strand must be marled over its length.
- Tucks must be dag-knotted. Rope must be whipped. Serving should be put on tightly with first three tucks, left uncovered.
- Try to get splicing as smooth as possible.
- Smoothness and elasticity plays a role in splicing. (4)

4.3 Galvanising is a process where a protective barrier of zinc is applied between the steel and the environment. (2)

4.4
- Manilla
- Sisal
- Hennep
- Cotton (4)

4.5 Pulley groove to small will shorten the life span of a rope. There is friction on the rope and pulley. (2)

4.6 Preforming
- Wires and strands are set to a pattern beforehand.
- Prevent the natural tendency of the rope to straighten.
- It can be cut without clamping.

Postforming
- Obtain by putting rope over seven rollers. Rollers placed before matrix.
- Remove stress in individual wires.
- Tension relieved by giving rope a quarter ton. (6)

[20]

QUESTION 5

5.1 The turnbuckle is a wire rope attachment used to ensure tension in wire ropes and to adjust the length of wire ropes. (2)

5.2 $F = m.g$
= 4 000 kg × 9,81 m/s✓
= 39 240 N✓

$W = F \times distance$
= 39 240 n × 250 m✓
= 9 810 000 Nm✓
= 9,81 MJ✓✓ (6)

5.3
- The eye bearing is protected against wear.
- The stirrup can be reeved without the additional weight and cost of a reeving thimble.
- The stirrup can be easily replaced if damaged on the spot.
- The stirrup gives all the advantages of a thimble while retaining the flexibility of a soft eye or loop.
- The side of the loop is protected when the sling or rope is withdrawn from under a load. (Any 4 × 1) (4)

5.4
- Band and plate coupler
- Swivel coupler
- Internal spigot coupler (3)

[15]

QUESTION 6

6.1
- A backfire is a loud noise produced by the gases at the cutting or welding nozzle tip
- usually followed by a minor flashback which sometimes reignite or switch off at the tip. (2)

6.2
- Open the acetylene cylinder valve (about half a turn) and then turn the pressure regulator knob clockwise to adjust the pressure to 34 kPa.
- Open the oxygen cylinder valve fully and then turn the pressure regulator knob clockwise to adjust the pressure to 68,9 kPa.
- Open the acetylene valve on the torch (about half a turn) until you barely hear the acetylene escaping.
- Use a striker to light and adjust the acetylene and oxygen valve on the torch until the correct flame is set.
- Check with the cutting lever to ensure a neutral flame is set and then release the lever to return to its midpoint. (5)

6.3 6.3.1 The gas regulator knob is turned clockwise to adjust the working pressure that is required to cut or weld, so that gas can enter the system.

6.3.2 Gas cylinder valves are used to release and shut off the gas that is stored at very high pressure in the cylinders.

6.3.3 A gas cylinder trolley is used to move the oxyacetylene equipment from one point to another.

(3 × 2) (6)

6.4 6.4.1 They are used when roped together to scale a cliff for securing the middleman to the bight of the rope. (2)

6.4.2 They are used for joining two hawsers together when the join has to pass around the capstan. (2)

6.4.3 They are used when the rope and hook are of unequal size. (1)

6.4.4 They are used as a common tie for bending together two ropes of approximately equal size. (2)

[20]

TOTAL: 100