



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

RIGGING THEORY N2

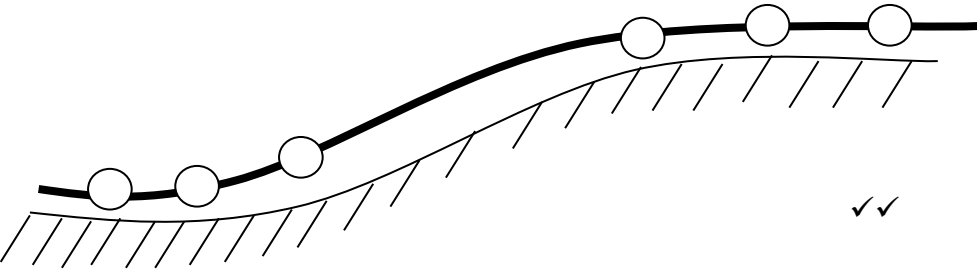
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This marking guideline consists of 6 pages.

- 2.3
- Damage to the ratchet, can slip or worn out gears.
 - Corrosion of the jack.
 - Condition of the jack.
 - Wear on the shaft of the jack.
 - Adjusting lever is damaged.
- (Any 3 × 1) (3)
- 2.4 A snatch block are single blocks in which part of the shell is hinged to allow a rope to be inserted in the swallow from one side. (2)
- 2.5 To prevent the sling from being damaged. (2)
- [15]**

QUESTION 3

- 3.1
- Wear on the rope
 - Corrosion on the rope
 - Fatigue on the rope
 - Accidental damage on the rope
 - Distortion on the rope
- (5)

- 3.2
- 
- (2)

- 3.3 Alloy steel chain should not be annealed because it reduces the hardness✓ and the strength✓ of the equipment. The alloy steel chain also will also stretch causing it to break easily.✓ (3)
- [10]**

QUESTION 4

- 4.1
- Permanent drum winders for vertical shafts and inclined shafts
 - Friction Koepe winders
 - Drum winders for sinking shafts
 - Platform winders for sinking shafts
- (4)
- 4.2 4.2.1 Platform ropes are used to suspend the sinking platform and to act as a guide for the kibble cross-heads✓ during the greater part of the kibble wind.✓
The ropes that are used in construction are the six strand triangular winding ropes and the triangular no-spin ropes.✓

- 4.2.2 The platform has four separate ropes which has its own drum.✓ In each rope only two parts are used and the other ropes assist in case of any breakage in the rope.✓

(2 × 3) (6)

4.3



(2)

- 4.4 A – grip pulley
B – v-groove pulley
C – flat belt pulley

(3)
[15]**QUESTION 5**

- 5.1 A – lifting eye
B – plate grip
C – horizontal clamp base

(3)

- 5.2 horizontal plate clamp

(1)

- 5.3
- Slide the plate clamps on to the plate.
 - Hook the shackle and sling on the lifting eye.
 - Hoist the sling up until the arm with the plate grip clamps the plate.
 - Ensure the plate grip is not smooth because the clamp can slip out.
 - Check for secureness of the plate clamp and the lifting equipment and then do the lift.

(5)

- 5.4 safe working load

(1)
[10]

QUESTION 6

- 6.1 6.1.1 Radius is the horizontal distance from the centre line of the lifting hook to the centre about which the jib slews to the nearest base line.
- 6.1.2 Outreach is the horizontal distance from the centre line of the lifting hook to the nearest point on the chassis.
- 6.1.3 Slewing is the rotary motion of the crane jib in a horizontal plane.
(3 × 2) (6)
- 6.2 6.2.1 Guy anchors are used for heavy loads. They stretch considerably and their tension can be adjusted. They are commonly used in ship masts, radio masts, wind turbines and utility poles.
- 6.2.2 Double staking anchors are used in the environment where there are no other source of anchors. The double staking anchor is pinned into the ground and a rope is used for rigging.
(2 × 2) (4)
- 6.3 Mobile cranes:
• can move into tight areas.
• saves time when doing a job.
• is easy to set up.
• can lift up heavy and large loads easily and positioning a load with ease.
• can travel to remote locations.
• make job sites much safer.
(Any 5 × 1) (5)
- 6.4 The crane:
• must be level
• must have free movement of the cabin on platform
• must not be moved whilst load is hanging from the jib
• When jib must be in a high position and the load must not bump against the jib
• must not lift a load whilst the chassis rest on springs
(5)
[20]

QUESTION 7

- 7.1 a) $A1 = \pi \times 0,1^2$
 $= 0,03142 \text{ m}^2$
 $= 0,03142 \times 2$
 $= 0,0628 \text{ m}^2 \checkmark$
- $A2 = l \times b$
 $= 5 \times 0.2$
 $= 1 \text{ m}^2 \checkmark$
- Total Area = $A1 + A2$
 $= 0,0628 + 1$
 $= 1,0628 \text{ m}^2 \checkmark$
- b) $M = A \times \text{specific mass}$
 $= 1,0628 \text{ m}^2 \times 80 \text{ kg/m}^2 \checkmark$
 $= 85,024 \text{ kg} \checkmark$ (5)
- 7.2 a) $A = l \times b$
 $= 1,2 \times 1.2$
 $= 1,44 \text{ m}^2 \checkmark$
- Total Area = $A \times 6$
 $= 1,44 \times 6 \checkmark$
 $= 8,64 \text{ m}^2 \checkmark$
- b) $V = A \times H$
 $= 8,64 \text{ m}^2 \times 1,2 \text{ m} \checkmark$
 $= 10,368 \text{ m}^3 \checkmark$ (5)
- [10]**
- TOTAL: 100**