



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

APRIL EXAMINATION

BUILDING AND CIVIL TECHNOLOGY N3

5 APRIL 2016

This marking guideline consists of 7 pages.

QUESTION 1

- 1.1 1.1.1 It is the process which allows management to think about the future and decide what to do.
- 1.1.2 It is a management function that directs activities in such a way that the desired results are obtained and maintained.
- 1.1.3 It is the art of getting people to do their best. Usually incentives are used to motivate people.
- 1.1.4 It is the mutual exchange of ideas and the interpretation of messages and signals.
- (4 × 2) (8)
- 1.2 • Take reasonable care of his/her health and safety and that of other persons who may be affected by his/her acts or omissions.
- 1.2 • With regard to any duty or requirement imposed on an employer or any other person by this act, cooperate with such employer or person to enable that duty or requirement to be performed.
- 1.2 • To carry out any lawful order given to him and obey the health and safety rules and procedures laid down by his employer or by anyone authorised thereto by his employer in the interest of health or safety.
- 1.2 • If any situation which is unsafe or unhealthy comes to his/her attention, such situation should be reported as soon as practicable to the employer or to the health and safety representative for his/her workplace or section thereof, as the case may be, who shall report it to the employer.
- 1.2 • If he/she is involved in any accident which may affect his health or which has caused an injury to himself/herself, such incident should be reported to his employer.
- (Any 4 × 1) (4)
- 1.3 • An employer shall keep a register or any other record of all employees regarding wages, time worked, payments for piece work and overtime and all other prescribed particulars,✓ and shall at all reasonable times produce such register or record or a microfilm or other microform reproduction thereof on demand to an authorised person referred to in section 7 for inspection.✓
- 1.3 • An employer shall retain the register, record or reproduction referred to in subsection 1 for a period of at least four years after the date of the last entry in that register or record.✓
- 1.3 • An employer who fails to comply with a provision in this section shall be guilty of an offence.✓
- (4)

[16]

QUESTION 2

- 2.1 Independent tubular steel scaffold (2)
- 2.2
- 1 Guard rail
 - 2 Mesh brick guard
 - 3 Boarded working platform
 - 4 Toe board
 - 5 Ladder (5)
- 2.3 Scaffolding is a temporary structure used for supporting workmen and materials during construction, maintenance and building operations. (2)
- 2.4
- Isolated/Pad foundation
 - Strip foundation (2)
- 2.5
- 1 Weak concrete blinding
 - 2 Distribution bars
 - 3 Main bars in both directions
 - 4 Reinforced concrete (1 : 2 : 4/20 mm aggregate) column foundation
 - 5 Starter bars for column. (5)
- [16]**

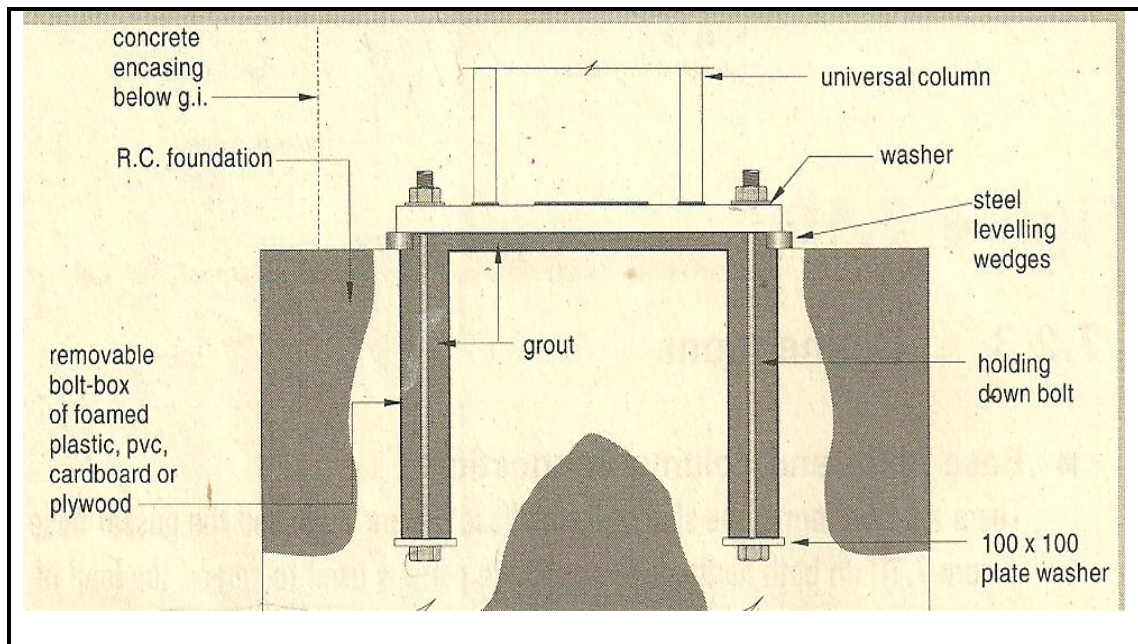
QUESTION 3

- 3.1 3.1.1 After the concrete has been placed in position, it should be well rammed or tamped to consolidate it and to eliminate trapped air. This is done either by hand or mechanically.
- 3.1.2 Concrete becomes stronger with age. The longer it stands, the stronger it becomes. It reaches its maximum strength at a hundred years (age).
- 3.1.3 An amount of water to a proportion of cement would be the water/cement ratio. Example: 21 litres of water to 20 kilograms of cement
- 3.1.4 It is that part of an aggregate which (mostly) passes through a sieve with 5 mm mesh openings.
- 3.1.5 It is that part of an aggregate of which at least 90% by mass is retained on a sieve with 5 mm mesh openings. (5 × 1) (5)

- 3.2
- The mix should not dry out on the way.
 - Segregation of materials should be avoided at all times.
 - Cast concrete should be properly compacted in its final position as soon as possible.
- (3)
- 3.3
- Cement should be stored on a damp-proof floor in a dry place and kept for a short period of time.
 - It should be stacked on pallets or scaffold boards without nails or similar protrusions and not flat on a concrete floor.
 - Cement should be stored in a draught-free shed with one bag/pocket placed flat on top of the other.
 - It should be covered with 250 micro thick damp-proof course material if possible.
 - Cement bags/pockets should be handled carefully to minimise wastage, even though the bag is lined with 3 layers of papers.
 - Stored cement should be used on the floor (first in, first out) principle, as the strength of the cement powder could deteriorate with age. (Any 4 × 1)
- (4)
- 3.4
- Concrete should not be cast if the temperature is below 4°.
 - No building work should be done on the concrete for at least three days after it has been cast.
 - Not more than 35 minutes should elapse between the mixing and the final placing of the concrete.
 - Concrete should never be dropped into position from a height of more than 1,2 m.
 - Do not forget that concrete gains its full strength after 28 days. (Any 4 × 1)
- (4)
- [16]**

QUESTION 4

4.1

**MOUNTING OF STRUCTURAL STEEL COLUMN BASE****MARK ALLOCATION**

Correct sketch = 5

Any 4 labels $\times \frac{1}{2} = 2$

Neatness = 1

(8)

- 4.2
- | | |
|-------|---------------------------|
| 4.2.1 | Stopcock |
| 4.2.1 | Water-level control valve |
| 4.2.3 | Tap (external) |
| 4.2.4 | Water meter |
| 4.2.5 | Tap (sink) |
| 4.2.6 | Tap (bath) |
| 4.2.7 | External tap |
| 4.2.8 | Copper |

(8 $\times$ 1)(8)
[16]

QUESTION 5

- 5.1
- Strength
 - Durability
 - Moisture resistance
 - Fire resistance
 - Thermal properties
 - Acoustic properties
 - Stability
 - An appropriate attractive finish
- (Any 5 × 1) (5)
- 5.2 Plastering is a cheaper way of providing a durable and hygienic surface for walls and ceilings. (2)
- 5.3
- Sandpaper the surface to a smooth finish and dust off.
 - Wash with lacquer thinner to remove natural oils from the surface.
 - Add one coat of varnish thinned in the ratio of two volumes of varnish to one volume of mineral turpentine. The varnish should be brushed well into the grain of the wood to ensure through penetration. Allow a minimum of 16 hours for drying after each coating.
 - Add another coat of varnish thinned in the ratio of three volumes of varnish to one volume mineral turpentine.
 - Add one coat of varnish, not thinned, and flow on fully with brush.
- (5)
- 5.4 5.4.1
- Kitchens
 - Bathroom floor
 - Hospital floors and shop floors
- (Any 2 × 1) (2)
- 5.4 5.4.2
- Bathroom floors
 - Toilet floors
 - Veranda's
 - Patios
 - Pathways
- (Any 2 × 1) (2)

[16]

QUESTION 6

- 6.1
- Barrier kerb
 - Semi-mountable kerb
 - Mountable kerb
- (3)
- 6.2
- It demarcates the road edge.
 - It drains storm water to gulley inlets.
 - It prevents erosion.
 - It prevents vehicles getting onto the footway easily and thus serves as a form of pedestrian protection.
- (4)
- 6.3 Part of the road reserved only for pedestrians (2)
- 6.4
- 6.4.1
- Area of the wall $= 6 \times 2,7 \checkmark$
 $= 16,2 \text{ m}^2 \checkmark$
- Door opening $= 2 \times 1$
 $= 2 \text{ m}^2 \checkmark$
- Total area $= 16,2 - 2 \checkmark$
 $= 14,2 \text{ m}^2 \checkmark$ (5)
- 6.4.2 Amount of bricks required $= 14,2 \times 100 \checkmark$
 $= 1\,420 \text{ bricks} \checkmark$ (2)
- 6.4.3 Amount of sand required $= 1\,420/1\,000 \checkmark$
 $= 1,42 \text{ ton} \checkmark$ (2)
- 6.4.4 Labour cost $= 14,2 \times 100 \checkmark$
 $= \text{R}1\,420,00 \checkmark$ (2)
- [20]**
- TOTAL: 100**