higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

MATERIALS
NQF LEVEL 4

XX February 2020

This marking guideline consists of 5 pages.

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QUESTION 1

1.1
- High creep
- Low-elastic modulus
- High coefficient of expansion
- Degradation in UV-light
- Low density
- Combustibility
- Electrical insulation (Any 5 × 1) (5)

1.2
- Select a holder that will hold both samples.
- Fill the holder with water and place both samples in the water.
- If the sample floats it will be a thermoplastic.
- If it sinks to the bottom it is a thermoset plastic. (4)

1.3
- Make sure that the edges of the pipe are clear of dust, cracks and dirt.
- Lightly sand the end of the pipe and the inside of the socket.
- Mark the depth of the socket on the pipe that fits into it.
- Paint the inside of the socket and the marked pipe that fits into it with solvent.
- Immediately fit the two pipes together and turn the pipes slightly to secure the joint.
- Press pipe hard into socket and hold in position for at least 30 seconds. (6)

1.4
- Kitchen sinks
- Bathroom and bedroom cupboards
- Wash basins
- Toilet bowls
- Shower doors and cubicles (5)

[20]

QUESTION 2

2.1 **Neoprene:**

- Electrical insulation
- Window seals, curtain wall panels, roofing and flashing
- Water-resistant products, paints, adhesives, bridge bearings (Any TWO)

Butyl rubber:

- Roof, concrete and metal sealant
- Plumbing joints such as water bars or in building reservoirs

(2 + 2) (4)

2.2 Flow-grade sealants come in liquid form✓ and are poured into the joint that has to be sealed.✓ It flows into the joint and comes into contact with both surfaces of the joint.✓ The joint should be slightly over-filled to about 1 mm above its surface.✓ (4)

2.3
- Nonstaining
- High strength
- Can be painted over (Any 2 × 1) (2)

[10]

QUESTION 3

3.1
- Chemical factors like Van der Waal's forces
- Surface area of the joint
- Cleanliness of the surfaces
- Texture of the surfaces
- How well they interlock
- Strength of the adhesive
- Penetration of the adhesive into the substrate
- Ability of adhesive to fill gaps in the material to which it is applied
- Compatibility of adhesive with the substrate (Any 6 × 1) (6)

3.2
- Nontoxic
- Easy to apply
- Indoors and outdoors
- Good chemical resistance
- Clear finish (5)

3.3
- Lose strength
- Brittle
- Lose bonding capacity
- Crack (4)

[15]

QUESTION 4

4.1 4.1.1
- Hold pigments and additives together
- Provide adhesion
- Allow paint to cure into a thin plastic film (3)

4.1.2
- Dilute paint, making it easier to apply
- Increase penetration of the paint
- Evaporate as paint dries, helping paint to harden (3)

4.2
- The materials and application are cheaper than rendering.
- No skilled person is needed to do the application.
- Although textured the brickwork pattern is still visible.
- It provides a weather-proof finish if done correctly.
- It can be applied to old as well as new brickwork or concrete blocks.
- It is one of the easiest finishes to achieve. (Any 5 × 1) (5)

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4.3
- Using the wrong primer
- Incorrect application of primer
- Saponification
- Seepage of moisture through walls
- Unprimed walls painted while the wall is still moist
- Poor preparation of the surface before painting (Any 3 × 1) (3)

4.4 4.4.1 Treated timber used indoors and not in contact with the ground

4.4.2 Timber exposed to the elements, but not in contact with the ground

4.4.3 Timber permanently or periodically exposed to salt water

(3 × 2) (6)
[20]

QUESTION 5

5.1
- Place primer on the roof surface.
- Lay the scrim on the primed surface.
- Apply the liquid water-proofing material to the scrim.
- Paint the layered system with silver paint.
- Cover it with stones. (5)

5.2
- It is weather-resistant.
- It is non-toxic and poses no environmental threat.
- It has high adhesive power.
- It extends the life span of the roof.
- It is highly flexible and bridges crack in substrates. (5)

5.3
- Dampness that develops on the inner walls of the house around the windows and doors
- Moisture that collects at the base of the walls and rises up into the wall due to ineffective drainage
- Outer walls that crack due to excessive moisture
- Peeling paint as a sign of dampness
- No weep holes on the DPC course (5)
[15]

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QUESTION 6

6.1
- All employees working with bitumen must attend an induction session on the risks concerning awareness and dangers associated with bitumen.
- Create a risk-assessment file for every employee.
- Hold daily toolbox meetings with safety reps.
- Properly train employees.
- Provide personal protective clothing (PPC) and personal protective equipment (PPE) to every employee. (5)

6.2
- Skin, eye and nasal irritation
- Chemical burns
- Severe headaches and dizzy spells
- Skin and lung cancer
- Pollutes environment
- Highly volatile
- Very flammable and toxic (Any 3 × 1) (3)

6.3
- Penetration test
- Softening-point test
- Viscosity test
- Ductile test (Any 2 × 1) (2)

[10]

QUESTION 7

7.1
- Cost-effective
- Easily assembled and re-used
- Resistant to fatigue
- Materials of any shape and size can be joined
- Similar as well as dissimilar materials can be joined
- Improved stress distribution
- No distortion or discolouration visible (Any 3 × 1) (3)

7.2
- Uncertainty in tightening the final bolt-tension load
- Damage to bearing surface
- Problematic tightening of large bolts
- Difficulty in loosening bolts
- Simultaneous tightening rarely possible (Any 3 × 1) (3)

7.3
- Edge tear-out
- Bolt shear
- Bearing failure
- Net section failure (4)

[10]

TOTAL: 100

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