higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

MATERIALS
NQF LEVEL 3

XX February 2020

This marking guideline consists of 6 pages.

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QUESTION 1

1.1 1.1.1 A layer of leaving cells that lies between the inner bark and sapwood

1.1.2 The part of the tree that carries sap from the leaves to the cells that allow the tree to grow

1.1.3 The tough outermost layer that protects the tree from the sun and weather and against damage

1.1.4 Dead wood at the centre of the tree that has no sap running through it

1.1.5 Newly formed outer wood that lies between the cambium and the heartwood of the tree

(5 × 2) (10)

1.2
- They use nails that act in shear.
- They are available in different widths.
- They come in various configurations.
- They provide effective load transfer.
- They have various applications.
- They provide a secure support for connecting timber beams and joints.

(Any 5 × 1) (5)
[15]

QUESTION 2

2.1 2.1.1 True
2.1.2 True
2.1.3 False
2.1.4 True
2.1.5 True

(5 × 1) (5)

2.2
- It is generally more economical per centimetre cut than other cutting machines.
- The cost of tools and equipment is greatly reduced.
- The set-up time for flame cutting is minimal.
- It is a flexible and simple method.
- It has a short lead time. (5)

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2.3 2.3.1 Metals are chemical elements that easily lose electrons and their atoms form metallic bonds with the atoms of other metals. (2)

2.3.2
- Electric and heat conductivity
- Malleability
- Ductility
- Lustre
- Strength and hardness
- High melting point
- Density (Any 3 × 1) (3)

2.4
- Very little floor space is needed for a laser cutter.
- Heat is applied to a very small area and this prevents the metal from warping or twisting.
- It poses a fairly low risk of injury.
- It is a non-contact process.
- It is a relatively quiet process, resulting in little noise pollution.
- The laser does not wear during the cutting process. (Any 5 × 1) (5)

[20]

QUESTION 3

3.1
- Churches
- Malls
- Stadiums (3)

3.2
- It is the cheapest and most versatile form of steel.
- It has a high stiffness quality.
- It comes in a wide variety with different properties.
- Most types of carbon steel are easily machined and welded.
- It is the most versatile form of steel and is used where a bulk amount of steel is required.
- It has ferromagnetic properties, which makes it ideal for use in the manufacture of electrical devices and motors. (Any 5 × 1) (5)

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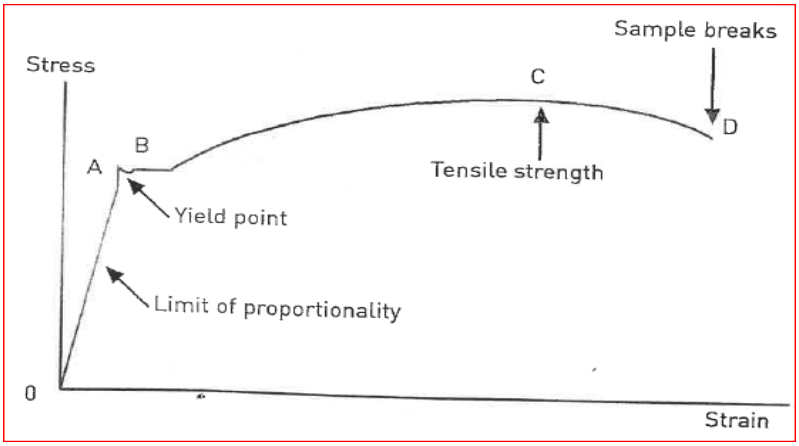
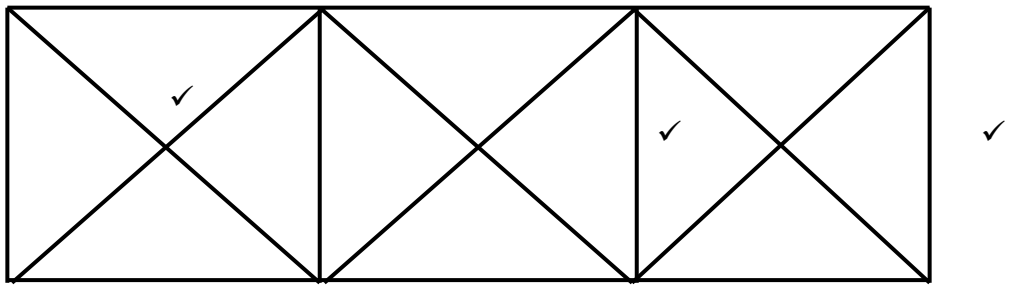
3.3



(5)

3.4



(3)

3.5
- It loses strength and stiffness until it buckles.
- It is not combustible, which means it does not catch fire itself.
- By the time it reaches 600 °C, it has already lost half of its strength.
- When structural steel components deform due to fire, they can no longer bear the loads they were designed to bear and the structure could collapse.

(4)
[20]

QUESTION 4

4.1 4.1.1 Deterioration is the breaking down of a compound.
4.1.2 Corrosion is the deterioration of a material via a chemical reaction.
4.1.3 Oxidation is the reaction where a substance loses electrons.

(3 × 1) (3)

4.2 4.2.1 Type of corrosion which decreases the thickness of the metal through an electrochemical process

4.2.2 Type of corrosion which occurs when two different metals are in contact with each other and one of them is willing to give up electrons

4.2.3 Type of corrosion which occurs due to bacteria, fungi and mould caused by acids such as sulphur, ammonia and hydrogen sulphide that are used around the metals.

(3 × 2) (6)

4.3
- Metals rust when they are oxidised.
- Rust forms when there is a potential difference between the metal and a substance surrounding the metal, such as water or air.
- The element that gives away its electrons, easily rusts. A metal such as iron loses electrons to oxygen, resulting in the rusting of the iron. (3)

4.4
- Painting
- Drainage design
- Electroplating
- Hot-dip galvanising (Any 3 × 1) (3)

[15]

QUESTION 5

5.1
5.1.1 C
5.1.2 D
5.1.3 E
5.1.4 B
5.1.5 A

(5 × 1) (5)

5.2
- Welding✓ is the process of joining two or more metals together by melting a third material called a filler.✓ The filler forms a molten weld pool that act as a glue to join the metals.✓

- Brazing✓ is the process of joining two metals together by melting a third material called a filler.✓ It is done at a very high temperature with a map gas torch and the bond formed is much stronger.✓

- Soldering✓ is the process of joining two metals together by melting a third material called a filler.✓ It is done using a soldering iron at a lower temperature.✓ (3 × 3) (9)

5.3
- Shield manual arc welding (SMAW)
- Flux-cored arc welding (FCAW)
- Gas metal arc welding (GMAW)
- Tungsten inert gas welding (TIG)
- Submerged arc welding (SAW) (Any 4 × 1) (4)

5.4
- It alloys with great difficulty with lead.
- It has a high thermal conductivity.
- Aluminium oxides rapidly.
- It has a coat of aluminium oxide which melts at 1 972 °C (2 072 °C according to Google) (Any 2 × 1) (2)

[20]

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QUESTION 6

- Clean the steel window frame with a paint brush.
- Measure the width and the height of the window.
- Minus 3 mm from both measurements.
- Cut the measured size from your sheet. OR
- Order the exact size from the supplier.
- Make sure that the putty has a smooth consistency.
- Press a thin layer of the putty in a bedding motion around the frame.
- Carefully press the glass into the frame.
- Put the facing putty around the window frame at an angle of 45 degrees using a putty knife
- Trim off excess putty in the interior side and let it dry.
- Paint within 14 days. (Any 10 × 1) **[10]**

TOTAL: 100

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