higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

PULP AND PAPERMAKING TECHNOLOGY
NQF LEVEL 3

13 November 2024

This marking guideline consists of 6 pages.

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SECTION A

QUESTION 1

1.1 A
1.2 B
1.3 D
1.4 C
1.5 A
1.6 B
1.7 C
1.8 D
1.9 A
1.10 B

(10 × 1) **[10]**

QUESTION 2

2.1 False
2.2 True
2.3 True
2.4 False
2.5 False

(5 × 1) **[5]**

QUESTION 3

3.1 E
3.2 D
3.3 C
3.4 B
3.5 A

(5 × 1) **[5]**

QUESTION 4

4.1 woodyard
4.2 Contraries/Prohibited materials/Unwanted materials
4.3 lignin
4.4 Opacity
4.5 screen

(5 × 1) **[5]**

TOTAL SECTION A: 25

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SECTION B

QUESTION 5

5.1 Step 1: Sorting
Step 2: Slashing
Step 3: Debarking
Step 4: Chipping
Step 5: Screening
Step 6: Re-chipping
Step 7: Storing (7)

5.2 Weight of logs = Weight of truck with logs – Weight of truck without logs✓
= 15 000 kg – 10 000 kg✓
= 5 000 kg ✓ (3)

5.3
- Drum/Twin-drum debarker
- Rosser-head debarker
- Hydraulic-jet debarker
- Ring debarker (Any 2 × 1) (2)

5.4 Bagasse: The plant fibres that are left after the juice has been extracted from sugar cane stalk.✓✓ (2)

5.5
- The amount of rainfall when the sugar cane was grown
- The length of nodes and internodes on the sugar cane from which the bagasse comes
- The type of sugar-cane plant harvested
- The age of the sugar cane
- The way in which the sugar cane was harvested (Any 3 × 1) (3)

[17]

QUESTION 6

6.1 6.1.1 Recycled fibrous, cellulose material that has been collected for re-use to make paper.✓ (1)

6.1.2
- Stone
- Sand
- Textile
- Plastic
- Wood
- Metals (Any 2 × 1) (2)

6.2 6.2.1
- Electric motor
- Agitator/Stirrer/Rotor
- Baffles
- Vat/Vessel (4)

6.2.2
- Stator
- Rotor
- Electric motor (3)

6.3
- Detergents
- Dispersants
- Forming agents (3)

6.4
- The ink particles collide with air bubbles.
- The ink piece merges with the air bubbles.
- The air bubbles and the ink are removed from the pulp. (3)

6.5
- Groundwood pulping
- Pressurised groundwood pulping
- Thermomechanical pulping (3)

6.6
- Vertical continuous digester
- Horizontal continuous digester
- Vertical batch digester (3)

6.7 6.7.1 Digester loading: A chip hopper or conveyor feeds the wood chips into the open digester cap.✓✓

6.7.2 Cooking liquor charging: A mixture of white and black liquor is mixed in correct amount and pumped into the digester.✓✓

(2 × 2) (4)

6.8 6.8.1 Neutral Sulphite Semi-Chemical (NSSC) (1)

6.8.2
- Sodium sulphite (acid)
- Sodium carbonate (base) (2)

6.8.3
- A high yield of stiffer and stronger fibres than mechanical methods
- A higher yield than fully chemical pulping, but with the same quality
- Fibres and produce paper with good printing properties

(Any ONE) (1)

6.9 6.9.1 NaOH (1)

6.9.2
- Digester
- Refiner (2)

6.10 6.10.1 Temperature: 130 ºC – 140 ºC
6.10.2 Pressure: 800 KPa
6.10.3 Cooking time: 6 hours – 8 hours

(3 × 1) (3)

[36]

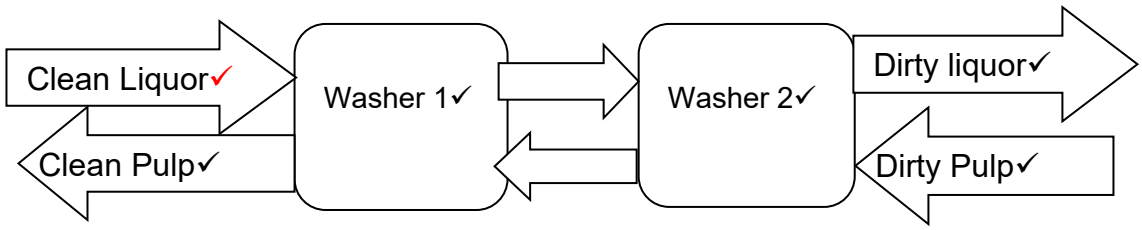
QUESTION 7

7.1 7.1.1 Up-flow tower
7.1.2 Down-flow tower
7.1.3 Up-down-flow tower
(3 × 1) (3)

7.2
- Chlorine
- Oxygen
- Hypochlorite
- Chlorine dioxide
- Hydrogen peroxide
- Ozone

(Any 2 × 1) (2)

7.3



(5)

7.4 To dilute spent liquor will require huge amounts of steam during evaporation in the evaporators. (1)
[11]

QUESTION 8

8.1 8.1.1
- Greeting cards
- Menu cover
- Tissue paper

(Any 2 × 1) (2)

8.1.2
- Logo/address embosser
- Custom artwork embosser
- Plastic handheld/desk embosser
- Electric embosser

(Any 3 × 1) (3)

8.2 8.2.1 web
8.2.2 nip
8.2.3 fly roll
(3 × 1) (3)

8.3 Lamination: It is when a film of plastic is applied to the surface of a paper. (1)

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8.4
- Making the paper smoother, which makes it easier to print
- Enhancing the paper's appearance
- Making the paper stiffer and thicker
- Making the paper waterproof (Any 2 × 1) (2)

[11]

TOTAL SECTION B: 75
GRAND TOTAL: 100

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