higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

PULP AND PAPERMAKING TECHNOLOGY
NQF LEVEL 3

XX February 2020

This marking guideline consists of 5 pages.

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QUESTION 1

1.1 False
1.2 True
1.3 False
1.4 False
1.5 True

(5 × 1) **[5]**

QUESTION 2

2.1 F
2.2 E
2.3 A
2.4 G
2.5 B

(5 × 1) **[5]**

QUESTION 3

3.1 Chipper
3.2 Quality control
3.3 Flash drying
3.4 Oxidants
3.5 Friction

(5 × 1) **[5]**

QUESTION 4

4.1 4.1.1
- Making visual estimates of how much bark is present in the pulp
- Taking samples from the pulp and counting the amount of bark pieces in these samples
- Measuring the amount of bark in samples of woodchips that are going to be used to make the pulp
- Measuring the bark left on logs that have been through the barking process (4)

4.1.2
- Drum debarker
- Ring debarker
- Rosser-head debarker
- Hydraulic-jet debarker (3)

4.2 A conveyor belt that carries chips from the chip-screening machine is stopped.✓ Two metal plates are brought down onto the conveyor belt✓ and the chips between them are taken off the conveyor belt.✓ (3)

4.3
- Amount of rainfall when the sugar cane was grown
- Length of nodes and internodes of the sugar cane that the bagasse comes from
- Different types of sugar cane
- Age of the sugar cane that the bagasse comes from
- Way the sugar cane is harvested (Any 4 × 1) (4)

4.4
- Adjust feed to the washer to allow maximum cleaning.
- Adjust knife valves so that the contraries are pumped regularly.
- Adjust speed of the rotor until contraries in the outlet stream are minimal. (3)

[17]

QUESTION 5

5.1
- Pulper
- Deflaker (2)

5.2
A Shower water
B Fibre free of ink
C Scraper
D Drop leg
E Wash water with ink
F Vat
G Feed
H Drum

(8 × 1) (8)

5.3
- Addition of detergents or chemicals to dissolve the ink
- Aeration or addition of air to float the ink particles
- Skimming out the ink and washing the stock (3)

5.4
5.4.1 Corrugated boards
5.4.2 Fine and small
5.4.3 Paper with good printing properties but not very strong
5.4.4 Newspaper-grade pulp

(4 × 1) (4)

[17]

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QUESTION 6

6.1
- Burning and damage on the stone
- Not enough pulp being produced (2)

6.2
6.2.1 burst
6.2.2 opacity
6.2.3 tear
6.2.4 brightness
6.2.5 freeness
(5 × 1) (5)

6.3
A Top separator
B Vapour
C Deflector plate
D Blow-tank shell
E Dilution from wash plant
F Pulp to wash plant
G Agitator
H Cooked pulp from digester
(8 × 1) (8)

6.4
- Lower pulp strength than the Kraft process
- Acid-resistant equipment
- Only certain wood species (Any 2 × 1) (2)

[17]

QUESTION 7

7.1
- Mathieson process
- R3/SVP generator
- Hydrochloric acid-based process
- Methanol process (4)

7.2
- Preventing chemicals from carrying over to the next stage of the process
- Recovering expensive chemicals used during the pulping process (2)

7.3 Pulp moves upward inside the diffuser between two rings.✓ Wash water is sprayed into the middle of the rings.✓ Wash water forces dirty water out of the pulp✓ and passes it through the holes in the rings.✓ The spent liquor collects at the bottom of the plate✓ and drains into the storage tanks.✓ Clean pulp exits at the top of the washer.✓ (7)

7.4
- Not enough pulp-washing stages
- Too thick mat formed on the drum of the vacuum filter
- Too little wash-water supply due to slow flow or blocked shower
- Time spent in the washer too short
- Flow of wash water too high (Any 4 × 1) (4)

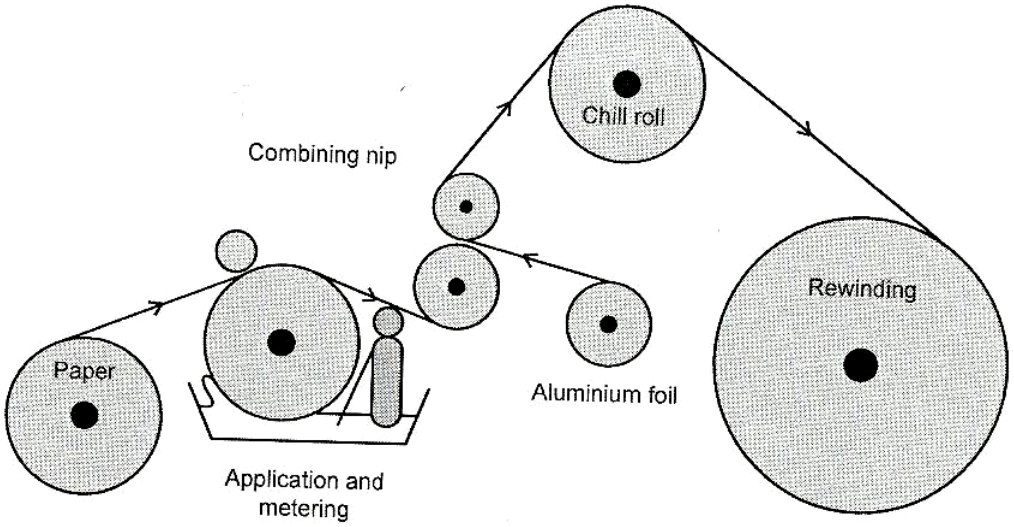
[17]

QUESTION 8

8.1
- There are between three to nine rolls in the calender stack.
- The rolls are kept in place by bearings.
- The top and bottom rolls in the stack consist of chilled iron.
- Rolls alternate between metal and filled rolls. (Any 3 × 1) (3)

8.2
- Chilled roll
- Thermo roll
- Polymer roll
- Composite fly roll (4)

8.3



(1 mark for each correct label) (6)

8.4 8.4.1 Slitter rigs split paper into the size needed and trim both edges.

8.4.2 A revolving knife controls the cutting speed relative to the speed that the paper is fed.

(2 × 1) (2)

8.5
- Dispersers
- Mixers
- Agitators
- De-aerators (Any 2 × 1) (2)

[17]

TOTAL: 100

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