higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

PULP AND PAPERMAKING TECHNOLOGY
NQF LEVEL 2

12 November 2024

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 False

(5 × 1) **[5]**

QUESTION 2

2.1 D
2.2 E
2.3 G
2.4 A
2.5 B

(5 × 1) **[5]**

QUESTION 3

3.1 Coniferous
3.2 Batch digester
3.3 Chemical recovery
3.4 Drying
3.5 Roll finishing

(5 × 1) **[5]**

QUESTION 4

4.1
- Nampak cartons and labels
- Nampak corrugated
- Nampak liquid
- Nampak sacks
- Nampak tissue

(Any 4 × 1) (4)

4.2
- It is a type of paperboard.
- It is specially manufactured for the production of corrugated board. (2)

4.3
- Screening relies on the use of various sized screens or filters.
- They have holes that only allow items of a certain size through.
- Pulp is let through the screens, but any other matter such as staples is left behind.
- Screens can then be cleaned to remove the contraries caught by it. (4)

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4.4
- Strength
- Smoothness, bulk and printability
- Stiffness (3)

4.5
- Chutes
- Tractors and trailers
- Skidding
- Cable yarders (4)

[17]

QUESTION 5

5.1 Tearing strength is the minimum force required to continue tearing the paper from an initial tear. (2)

5.2
- Clamp the piece of paper and then allow it to bend downwards.
- The amount that it bends is then measured and summed mathematically. (2)

5.3
- Weight
- Colour
- Usage
- Raw materials
- Surface treatment
- Finish (6)

5.4
- Cyclones (cleaners) separate the grit and other solid from the bagasse stream.
- Bagasse is fed into slurry pulper where dilution water is added to form bagasse slurry.
- The slurry is pumped to the rock cyclone where sand, stones and other impurities are removed from the bottom of the cyclone.
- Clean bagasse leaves the rock cyclone through the top outlet, from where it is distributed equally to the wet depithers. These depithers can be of a similar type as those used for moist depithing or otherwise vibrating screens can also be used for wet depithing.
- Clean bagasse is then transported to the digester via the clean fibre collection conveyor and ultimately to the digester feed conveyor.
- Bagasse together with steam and sodium hydroxide is fed into a pressurised horizontal continuous digester. (6)

5.5
- Bagasse washer
- Depithers
- Dewatering press
- Pin drum feeder (4)

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QUESTION 6

6.1
- Grinding unit
- Pressurised air system
- Hot-water grinder shower system
- Log loading system
- Pulp removal system (5)

6.2
- Treat the black liquor by bubbling air through it.
- The sulphur compound in the black liquor will oxidise. (2)

6.3 It is a chemical pulping process used for bagasse with caustic soda as the main cooking agent. (2)

6.4
- It may result in poor quality pulp
- Reduce production rate
- Poor paper strength
- High power consumption (Any 3 × 1) (3)

6.5 A – Oxidising
B – Drying
C – Reducing
D – Smelt
E – Primary air
F – Black liquor
G – Secondary air
H – Flue gas (8)

6.6
- Sulphur storage
- Sulphur furnace
- Quench tower
- Absorption tower (4)

[24]

QUESTION 7

7.1
- Lower retention than Fourdrinier
- High head box consistencies
- More pinholes
- Grainy formation
- Lower internal bond
- Pressure pulsations are translated into basis weight variations. (Any 5 × 1) (5)

7.2
- Approach flow system
- Head box
- Forming
- Pressing
- Drying (5)

7.3
- Sheet formation starts with a low drainage to prevent fibre loss.
- It has sufficient agitation to prevent the formation of flocks, i.e. forming the sheet. (2)

7.4 The purpose of trimming and guillotining is to trim the rough size of a sheet of paper to the final size. (2)

7.5
- No retained solvent
- No odour or taste
- No tunnelling, which speeds up further conversion
- Fast curing
- Direct coating on webs that are sensitive to solvents
- Low energy demand in drying by using low volume of heated air that can be recirculated (Any 5 × 1) (5)

7.6
- Aluminium foil with paper parchment
- Paper with paper (2)

7.7
- Letterpress printing
- Lithography printing
- Gravure printing
- Screen printing (Any 3 × 1) (3)

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TOTAL: 100

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