higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PULP AND PAPERMAKING TECHNOLOGY
NQF LEVEL 2

(6050372)

7 November 2022 (Y-paper)
13:00–16:00

This question paper consists of 7 pages.

123Q1N2207

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TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Start each section on a new page.
5. Use only a black or a blue pen.
6. Write neatly and legibly.

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SECTION A

QUESTION 1

Various options are given as possible answers to the following questions. Choose the correct answer and write only the letter (A–D) next to the question number (1.1–1.6) in the ANSWER BOOK.

1.1 A country in which papermaking did not originate.

A USA
B Europe
C China
D Egypt

1.2 … is the largest paper manufacturer in South Africa.

A SAPPI
B Kimberley-Clarke
C Mondi
D Nampak

1.3 Cellulose fibres can be recycled …

A twelve to fourteen times.
B eight to ten times.
C ten to twelve times.
D five to eight times.

1.4 An example of a bark fibre.

A Lignin
B Flax
C Hardwood
D Cotton

1.5 It is necessary when direct contact evaporation is being used.

A Black liquor oxidation
B Black liquor evaporation
C Chemical recovery
D Tail oil recovery

1.6 A process of removing air from something.

A Aeration
B Re-aeration
C De-aeration
D Respiration

(6 × 1) **[6]**

QUESTION 2

Choose an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A–L) next to the question number (2.1–2.6) in the ANSWER BOOK.

COLUMN A		COLUMN B	
2.1	The section that helps smooth out the paper further and creates a more uniform thickness	A	direct contact
2.2	Fibrous material gained directly from trees	B	spent liquor
2.3	Evaporators that use heat from the flue gases of the recovery boiler	C	chemical pulping
2.4	The process to convert wood chips directly into pulp	D	calendar
2.5	Used cooking liquor	E	secondary fibre
2.6	The application of an adhesive or a plastic sheet to paper	F	virgin fibre
		G	green liquor
		H	indirect contact evaporators
		I	dryer section
		J	thermomechanical pulping
		K	laminating
		L	letterpress

(6 × 1) **[6]**

QUESTION 3

Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (3.1–3.9) in the ANSWER BOOK.

3.1 The wet end is the section where the slurry or stock is poured into the machine.

3.2 A batch digester cooks one load of material at a time.

3.3 Sodium hydroxide acts like an acid.

3.4 Condensate is a product from the condensation process.

3.5 Causticizing is the process where white liquor is converted to green liquor.

3.6 The purpose of the forming section is to receive the rectangular flow of stock from the head box and to transform the stock flow into a wet sheet on the forming fabric.

3.7 Roll-formers have longer fabric life.

3.8 Supercalendering transforms latent qualities in the base sheet into visible qualities in the finished product.

3.9 The roll mass is always determined in the wrapping process.

(9 × 2) **[18]**

TOTAL SECTION A: 30

SECTION B

QUESTION 4

4.1 List the TWO main sources of waste paper. (2)

4.2 Define *secondary fibres*. (2)

4.3 Contraries form part of the bales of secondary fibre that are not supposed to be included.

Discuss the THREE methods that make contraries part of the bales of secondary fibre. (3 × 2) (6)

4.4 Mention FOUR grades of paper. (4)

4.5 Discuss FIVE factors that affect the smoothness of paper. (5)

4.6 Mention ONE way in which paper can be used in our homes. (1)

[20]

QUESTION 5

5.1 Explain the process of storing logs in a wood yard under the following topics:

5.1.1 Cold decking (4)

5.1.2 End checking (2)

5.2 Explain the function of each of the following equipment used during the bagasse processes.

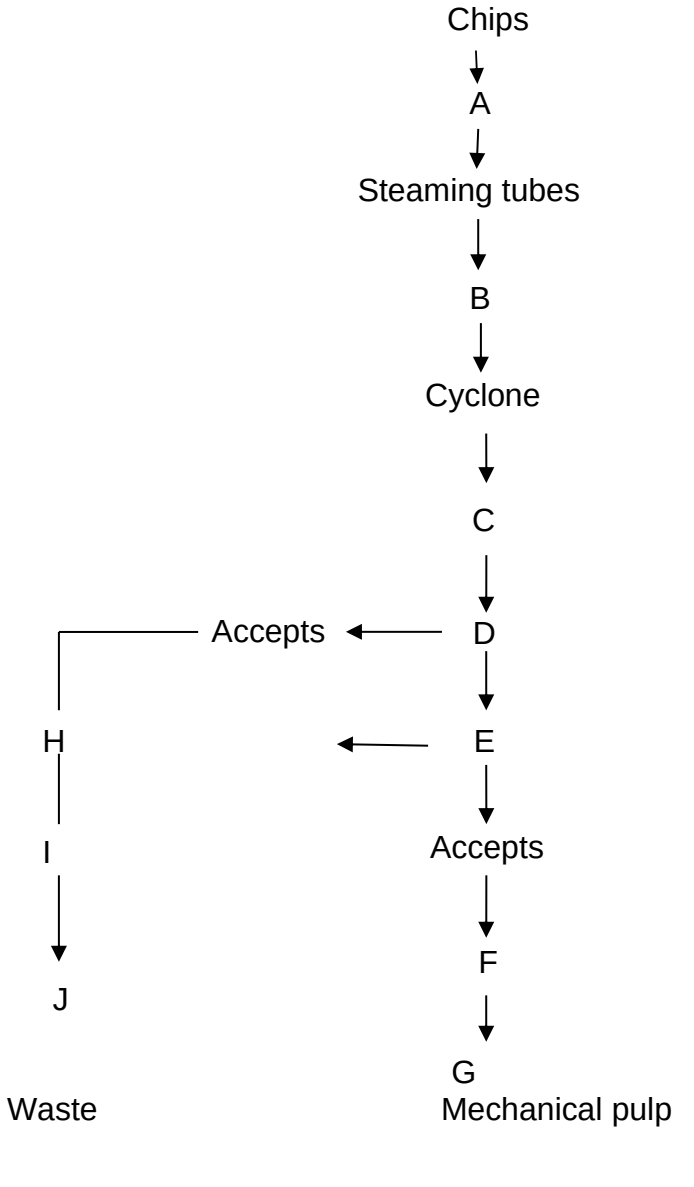
5.2.1 Bagasse washer

5.2.2 Pin drum feeder

(2 × 2) (4)

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5.3 Describe the thermomechanical pulping process by completing the following flow diagram. Write only the answer next to the letter (A–J) in the ANSWER BOOK.



(10)
[20]

QUESTION 6

6.1 Mention FOUR preventative steps to avoid sulphur trioxide forming in the burning process. (4)

6.2 Draw a process flow diagram indicating the sodium sulphite process. (4)

6.3 Complete and balance the reaction below as it occurs in the oxidising zone of a furnace.

$Na_2S + ….O_2 \longrightarrow$ (2)

6.4 Draw a diagram showing the FOUR phases of the Fourdrinier table. (4)

6.5 The pressing operation is considered to be an extension of the water removal process that started in the forming section.

Explain the THREE objectives of pressing as a process. (3)

6.6 State THREE advantages of hybrid formers over Fourdriniers. (3)
[20]

QUESTION 7

7.1 Briefly discuss the trimming or guillotining of paper. (4)

7.2 List THREE categories of embossing machines. (3)

7.3 Rolls are prepared for shipment in the roll finishing process.

Name the THREE steps involved in roll finishing. (3)
[10]

TOTAL SECTION B: 70
GRAND TOTAL: 100

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