higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PULP AND PAPERMAKING TECHNOLOGY
NQF LEVEL 2

(6050372)

2 December 2020 (X-paper)
09:00–12:00

This question paper consists of 7 pages.

225Q1N2002

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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 question on a new page.
5. Use only a black or blue pen.
6. Write neatly and legibly.

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QUESTION 1

Indicate whether the following statements are TRUE or FALSE by writing only 'true' or 'false' next to the question number (1.1–1.5) in the ANSWER BOOK.

1.1 A ream is made from 400 sheets of paper.

1.2 A head box shower is used in the reduction of foam.

1.3 Sodium sulphate is used as cooking liquor in the NSSC pulping process.

1.4 Sodium hydroxide (NaOH) is used to separate lignin from the wood.

1.5 Cellulose fibres can be recycled five to nine times.

(5 × 1) **[5]**

QUESTION 2

Choose a word or an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A–G) next to the question number (2.1–2.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
2.1	A practice in which bark is removed before the tree is cut	A	causticising
2.2	The central non-fibrous material of a sugar cane	B	letter printing
2.3	A process in which green liquor is converted into white liquor	C	pith
2.4	The removal of water from the sheet to consolidate the sheet.	D	screen printing
2.5	The type of printing process where printing surface is inked, and the inked image is transferred to the paper.	E	rip-stripping
		F	pressing
		G	forming

(5 × 1) **[5]**

QUESTION 3

Give ONE term for each of the following descriptions by writing it next to the question number (3.1–3.5) in the ANSWER BOOK.

3.1 A mixture of discarded paper and boards in all its forms.

3.2 The twisted, curly condition of fibres after being refined.

3.3 A process where a liquid is heated and changes into vapour.

3.4 A device used to attenuate a signal.

3.5 It involves sealing reams, packaging and taping cartons, wrapping them and stacking them on pallets.

(5 × 1) **[5]**

QUESTION 4

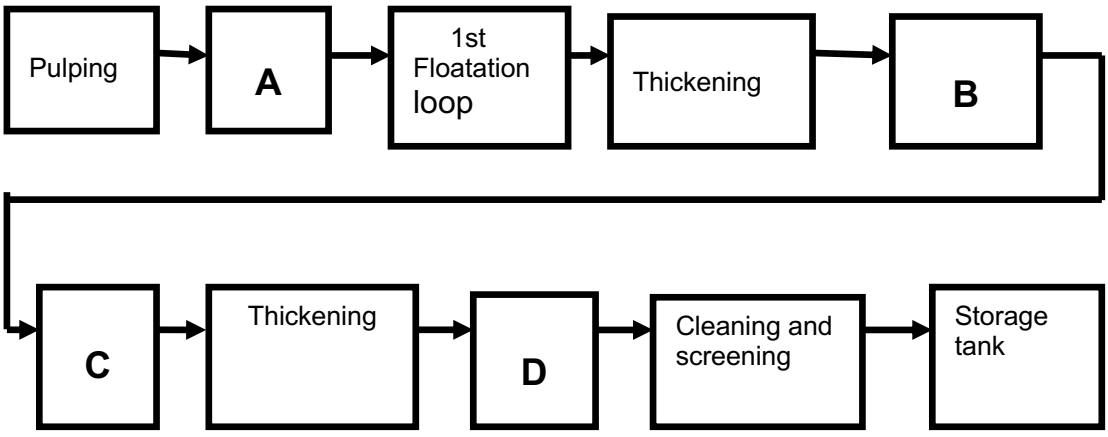
4.1 State THREE uses of steam in the pulp and paper industry. (3 × 1) (3)

4.2 The National Environmental Management Act (No 107 of 1998) (NEMA) is the most important legislation that forms the basis for all the environmental protection legislation which says the polluter must pay.

Explain the *polluter pays* principle. (2)

4.3 List THREE properties of wood fibres. (3 × 1) (3)

4.4 Complete the flow diagram of a de-inking process below by writing only the answers next to the letters (A–D) in the ANSWER BOOK.



(4)

4.5 Name THREE sources of secondary fibres. (3 × 1) (3)

4.6 Name TWO types of equipment associated with a vertical batch digester. (2 × 1) (2)

[17]

QUESTION 5

5.1 Describe the following grades of paper:

5.1.1 Cover stock

5.1.2 Tissue (2 × 3) (6)

5.2 How does the porosity of a sheet of paper influence the printing process? (2)

5.3 State TWO ways to increase the tensile strength of paper. (2 × 1) (2)

5.4 What is the required length of the logs coming from the plantation? (1)

5.5 Fines and pin chips reduce the quality of pulp and may complicate the operation of the digester.

Explain how fines and pin chips are recovered from the process. (4)

5.6 Give THREE examples of contaminants found in chips. (3 × 1) (3)

5.7 What is *rind*? (2)
[20]

QUESTION 6

6.1 Describe the working principles of a grinder feed (loading) system. (8)

6.2 Name FOUR components that are used in thermomechanical pulping. (4 × 1) (4)

6.3 Name FOUR preventive steps that can be used to minimise the formation of sulphur trioxide in the burning of sulphur during the calcium bisulphite production process. (4 × 1) (4)

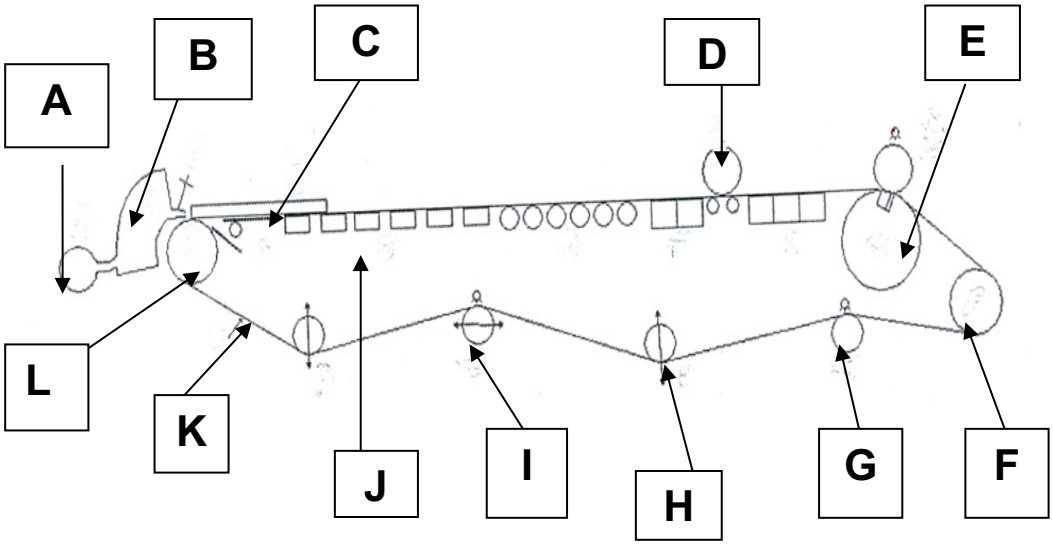
6.4 Give THREE reasons why chemical recovery was not used until the 1930s. (3 × 1) (3)

6.5 Name FIVE advantages of using a Copeland reactor. (5 × 1) (5)
[24]

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QUESTION 7

7.1 Complete the diagram of a Fourdrinier section below by writing only the names of the parts next to the letters (A–L) in the ANSWER BOOK.



(12)

7.2 Coating is the application of liquid onto the surface of paper by using a coating head or size press.

7.2.1 List FOUR examples of coated paper. (4 × 1) (4)

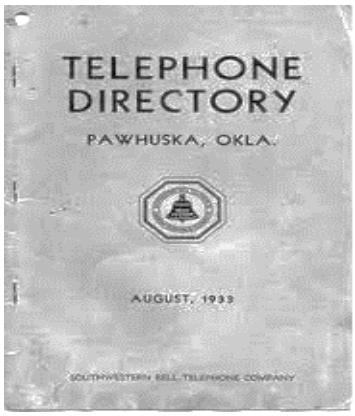
7.2.2 Describe the purpose of the coating process. (2)

7.3 Name a finishing process that could be used to produce the following products:

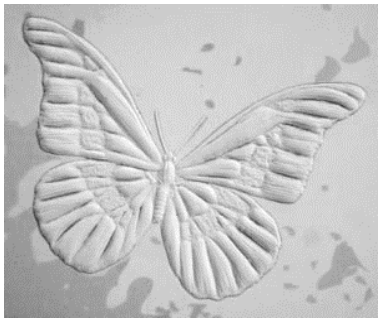
7.3.1



7.3.2



7.3.3



7.3.4



(4 × 1) (4)

7.4 Why is it important to store packaged paper in a warehouse? (2)
[24]

TOTAL: 100

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