higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PULP- AND PAPERMAKING TECHNOLOGY
NQF LEVEL 3

(6050383)

13 November 2018 (X-Paper)
09:00–12:00

This question paper consists of 7 pages.

NCV

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. Write neatly and legibly.

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SECTION A

QUESTION 1

Indicate whether the following statements are TRUE or FALSE. Choose the answer and write 'true' or 'false' next to the question number (1.1–1.5) in the ANSWER BOOK. Correct the statement if it is FALSE.

1.1 The wood-yard is the first step in the papermaking process.

1.2 The recommended size for wood chips is between 10 mm and 30 mm long.

1.3 Sludge and pith are waste from the bagasse washing.

1.4 A colour reversion tester is used to test the yellowing properties of pulp.

1.5 Secondary fibre can be recycled almost ten times before it becomes too short to be used in papermaking.

(5 × 1) **[5]**

QUESTION 2

Give ONE word/term for each of the following descriptions. Write only the word/term next to the question number (2.1–2.5) in the ANSWER BOOK:

2.1 Unwanted material in the process like sand, stones and plastic

2.2 The ease of water to drain through a mat of fibre

2.3 A thick mixture of fibre and water

2.4 Uncooked splinters of wood

2.5 The amount of pulp produced from wood

(5 × 1) **[5]**

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QUESTION 3

Choose a/an item/word from COLUMN B that matches a description in COLUMN A. Write only the letter (A–0) next to the question number (3.1–3.15) in the ANSWER BOOK.

COLUMN A		COLUMN B	
3.1	Small pieces of wood	A	dextrin
3.2	Uses radial arms to remove the bark	B	flotation
3.3	Common type of wood chipper	C	Kraft process
3.4	Soft spongy centre of bagasse	D	NSSC process
3.5	Main component in the grinding process.	E	wood-chips
3.6	Method used to remove ink from magazines	F	ramping
3.7	Equipment used to test wetness	G	disc chipper
3.8	The process of increasing temperature of liquor in the digester.	H	ring debarker
3.9	Twisting and bending of fibres during refining	I	embossing
3.10	NaOH breaks down the lignin to be absorbed by the alkali	J	soda process
3.11	Produces high yield 55%–85%	K	chlorine di-oxide
3.12	Bagasse is cooked in this process	L	pith
3.13	Used in the brightening process	M	Schopper Riegler
3.14	Increases quality of paper	N	latency
3.15	Water based glue	O	grindstone

(15 × 1) **[15]**

TOTAL SECTION A: 25

SECTION B

QUESTION 4

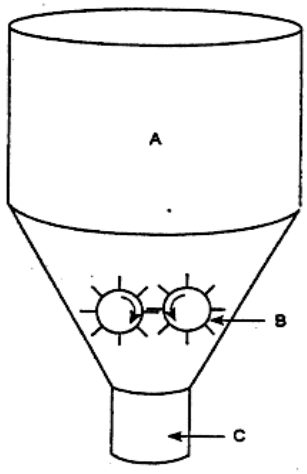
4.1 List FOUR ways used to measure the amount of bark in the pulp. (4)

4.2 Describe the working principle of a flat gyratory screen. (3)

4.3 Name TWO methods used to dispose of bark. (2)
[9]

QUESTION 5

5.1 Study the diagram below of a pin drum feeder and answer the questions in the ANSWER BOOK:



5.1.1 Label parts A and B in the ANSWER BOOK. (2)

5.1.2 What is the function of C? (1)

5.2 Name and describe the THREE factors of pulpmaking bagasse that need to be tested. (3)
[6]

QUESTION 6

6.1 Explain the working principles of a deflaker. (4)

6.2 Name THREE types of surfactants that are used in de-inking. (3)

6.3 Muzi works in a pulp mill that uses TMP. Help Muzi with the following problem:

Muzi sees that the pulp yield is too low and there are too many shives. Explain to Muzi why this is happening and what he can do to fix it. (4)

6.4 Give ONE disadvantage of ground-wood pulping. (1)

6.5 What are the reasons burn marks appear on the pulp in the grinding process? (2)

6.6 Name FOUR processes that occur in the Kraft digester during pulping. (4)

6.7 Give THREE solutions to large amounts of uncooked chips coming out of the Kraft pulping process. (6)

6.8 What test is carried out on the pulp to determine delignification? (1)

[25]

QUESTION 7

7.1 Name TWO equipment used in the NSSC pulping process. (2)

7.2 What is the typical operating temperature and pressure of the soda pulping process? (2)

7.3 List the FOUR advantages of the acid sulphite pulping process. (4)

7.4 Give THREE reasons for bleaching pulp. (3)

7.5 What are the TWO stages of the bleaching process? (2)

7.6 What are the reasons for obtaining low brightness after bleaching and how would you rectify this problem? (2)

7.7 Draw a block diagram of the washing process. (4)

7.8 Briefly explain the *counter current washing system*. (5)

7.9 What is the reason for carrying out a spent liquor solids concentration test? (2)

[26]

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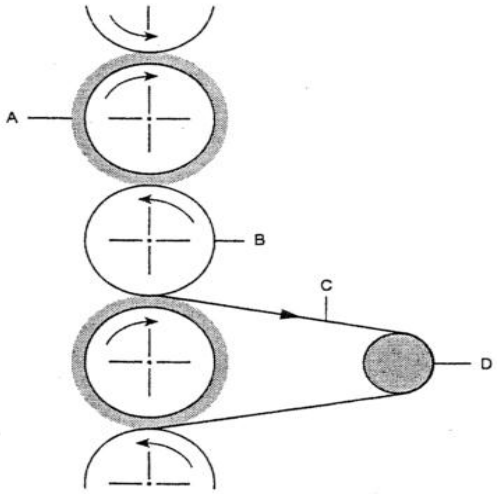
QUESTION 8

8.1 What are the TWO main reasons for embossing? (2)

8.2 Label parts (A–D). Write only the letter (A–D) answer next to the question number (8.2) in the ANSWER BOOK.



(4)

8.3 Name THREE materials that make up a coating mix. (3)
[9]

TOTAL SECTION B: 75
GRAND TOTAL: 100

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