higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PULP AND PAPERMAKING TECHNOLOGY
NQF LEVEL 2

(6050372)

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

This question paper consists of 8 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.

NCV

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.

1.1 The more pith the bagasse contains; the more useful fibres are produced.

1.2 The spent cooking liquor in sulphite cooking is called red liquor.

1.3 Reducing zone is found in the upper section of the recovery furnace.

1.4 Forming section is used to remove water and to consolidate the sheet.

1.5 The purpose of sorting and inspection is to ensure that quality paper is dispatched to clients.

(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 Hard circular areas on the log where a side Brach or stem once grew out.

2.2 The process during chemical pulping when lignin is removed.

2.3 The gaseous combustion product (smoke) that comes out of a furnace.

2.4 A stack of highly polished metal cylinders at the end of paper machine that smoothes and shines the paper surface as sheet pass through.

2.5 The removal of residual water from the sheet after having passed through the wet end of the paper, board or tissue machine.

(5 × 1) **[5]**

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QUESTION 3

Choose an item from COLUMN B that matches a description in COLUMN A. write only the letter (A–H) next to the question number (3.1–3.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
3.1	The ability of paper to allow air or other particles through	A	printing
		B	spent liquor
3.2	Pulping process that relies on heat in the form of steam	C	embossing
3.3	Causticised green liquor	D	porosity
3.4	Process by which multiple reproductions are made from a plate or image carrier on a press	E	opacity
		F	thermomechanical pulping
3.5	A process whereby a raised pattern is added to paper or board	G	white liquor
		H	groundwood pulping

(5 × 1) **[5]**

QUESTION 4

4.1 Name THREE industries that produce pulp and paper in South Africa. (3)

4.2 All pulp and paper mills have a smell that is caused by combination of chemicals being released into the atmosphere.

List TWO examples of these gases. (2)

4.3 Describe the following terms used to identify the different grades of secondary fibres:

4.3.1 Out-throws.

4.3.2 Prohibited materials.

(2 × 2) (4)

4.4 A batch digester cooks one load of materials at a time. Describe in sequence the events that occur during the batch digestion process. (6)

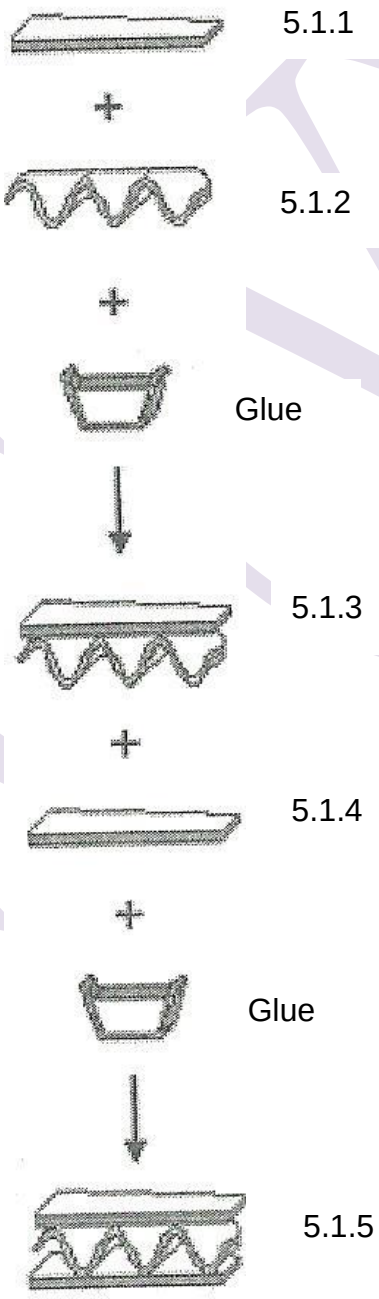
4.5 State FOUR factors to be considered when choosing plant fibres. (4)

[19]

QUESTION 5

5.1 Fluting is used together with linerboards to manufacture corrugated containers.

Complete the steps below on how corrugated container is manufactured and write only the answer next to the question number (5.1.1–5.1.5) in the ANSWER BOOK.



(5)

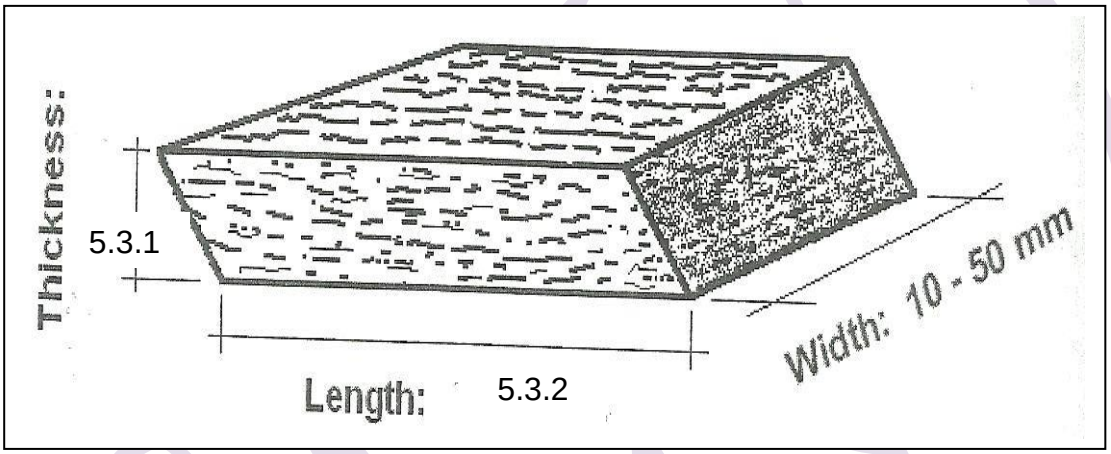
5.2 The thickness of paper is an important property for the production of the book and for printing.

5.2.1 What is the name of the instrument used to measure the thickness of the paper? (1)

5.2.2 List THREE factors that can influence the thickness of the sheet of paper. (3)

5.3 Production of uniform chips is important to producing a high quality pulp with minimum variation in quality.

Complete the dimension of the given chips below by writing by writing (5.3.1–5.3.2) in the ANSWER BOOK.



(2)

5.4 State THREE fractions in which chips are divided into after screening. (3)

5.5 It is important that chipper knives are always sharp. What type of chips will you produce when using dull knives? (2)

5.6 Why is it important to remove the pith (depithing) from bagasse before pulping process? (2)
[18]

QUESTION 6

6.1 Grind stone consists of tight-fitting abrasive segments that form a continuous grinding surface.

What will be the effect of the following grits on the properties of the pulp produced?

6.1.1 Coarse grits.

6.1.2 Small grits.

6.1.3 Intermediate sized grits.

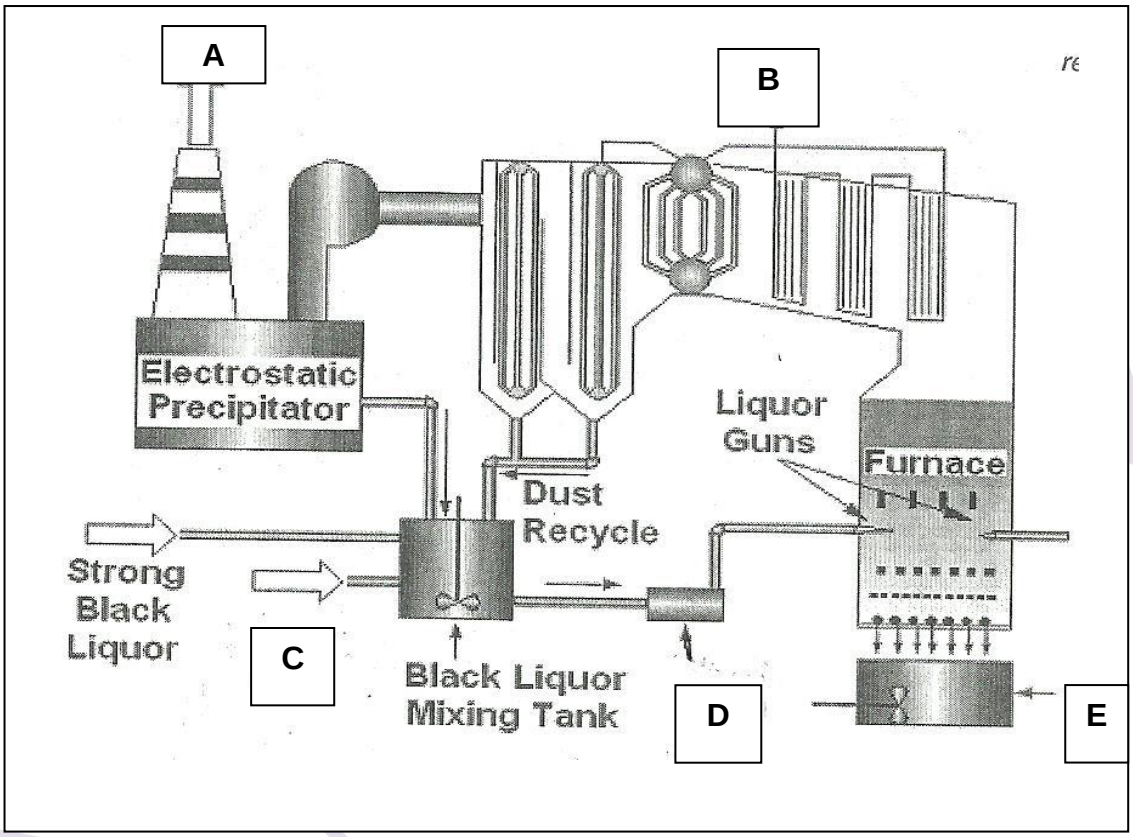
(3 × 1) (3)

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6.2 Pulp slurry produced by the grinder falls into a pit before overflowing into a flume channel.

What FOUR purposes does the grinder pit serve in the production of pulp slurry? (4)

6.3 Complete the diagram below of a chemical recovery system by naming the process (A – E) in the ANSWER BOOK.



(5)
[12]

QUESTION 7

7.1 List ELEVEN steps in sequence involved in the Kraft chemical recovery process. (11)

7.2 Define *combustion*. (1)
[12]

QUESTION 8

8.1 State FIVE disadvantages of using roll formers over Fourdrinier. (5)

8.2 Name FOUR types of forming sections. (4)

8.3 Internal head box shower is used to maintain a clean surface and to prevent the build-up of deposit which could cause a break on the machine in paper making.

List FOUR main points of the shower operation. (4)
[13]

QUESTION 9

9.1 Draw a diagram that represents a hot melt lamination process. (6)

9.2 Define *screen printing*. (2)

9.3 Name THREE types of coating equipment that can be used in the coating process of paper. (3)
[11]

TOTAL: 100

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