



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

**PULP AND PAPERMAKING TECHNOLOGY
NQF LEVEL 2**

(6050372)

**13 November 2019 (Y-Paper)
13:00–16:00**

This question paper consists of 6 pages.

TIME: 3 HOURS MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Read ALL the questions carefully.
 2. Answer ALL the questions.
 3. Number the answers according to the numbering system used in this question paper.
 4. Start each question on a NEW page.
 5. Write neatly and legibly.
-

SECTION A**QUESTION 1**

Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (1.1–1.5) in the ANSWER BOOK.

- 1.1 Coniferous woods are also called hard woods. 
- 1.2 A thermomechanical pulping process converts wood logs into chips.
- 1.3 Evaporation is a process whereby a liquid is heated to a temperature at which it changes into vapour.
- 1.4 Conventional drying uses metal cylinders arranged in two rows: one on top of the other.
- 1.5 Packed papers should be stored in a warehouse that is too dry.



(5 × 1)

[5]**QUESTION 2**

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

COLUMN A		COLUMN B	
2.1	The off-cuts obtained when the paper is cut	A	chemical production
2.2	A used cooking liquor from Kraft cook	B	laminating
2.3	A process that uses raw materials bought from external suppliers to produce cooking liquor	C	trimming
2.4	A system that receives rectangular flow of stock from the head box and transforms it into a wet sheet on the forming fabric 	D	forming
2.5	The process of bringing two or more materials together	E	black liquor
		F	coating
		G	green liquor
		H	paper cut

(5 × 1)

[5]

QUESTION 3

Give ONE word or term for each of the following descriptions. Write only the word or term next to the question number (3.1–3.5) in the ANSWER BOOK.

- 3.1 A ring around the heartwood of a tree.
- 3.2 The water cycle circuit from the thickener back to the showers.
- 3.3 The process of increasing water vapour content of a gas. 
- 3.4 The first part of the paper machine, consisting of wire and press.
- 3.5 A process in which ink or paint is impressed through the open mesh of a screen onto any desired surface.

(5 × 1) **[5]**

TOTAL SECTION A: 15

QUESTION 4

- 4.1 What was the main material used in Egypt to make writing materials? (1)
- 4.2 Steam used in pulp and paper mills is produced by burning coal, oil or gas.
-  4.2.1 State TWO applications of steam in pulp and paper manufacturing. (2)
- 4.2.2 Give TWO ways of producing steam. (2)
- 4.3 Describe de-inking as a process used to remove contraries from secondary fibres. (5)
- 4.4 List FOUR fibrous materials used to manufacture paper, board and tissue. (4)
- 4.5 Name TWO types of reaction wood.  (2)
- 4.6 What is the main cause of wood decay? (1)

[17]

QUESTION 5

5.1 Define the following terms that causes disturbance in the printing process.

5.1.1 Picking



5.1.2 Linting

5.1.3 Rupture

(2 × 3) (6)

5.2 State FOUR factors affecting the smoothness of paper. (4)

5.3 What are the THREE requirements for outdoor storage of logs? (3)

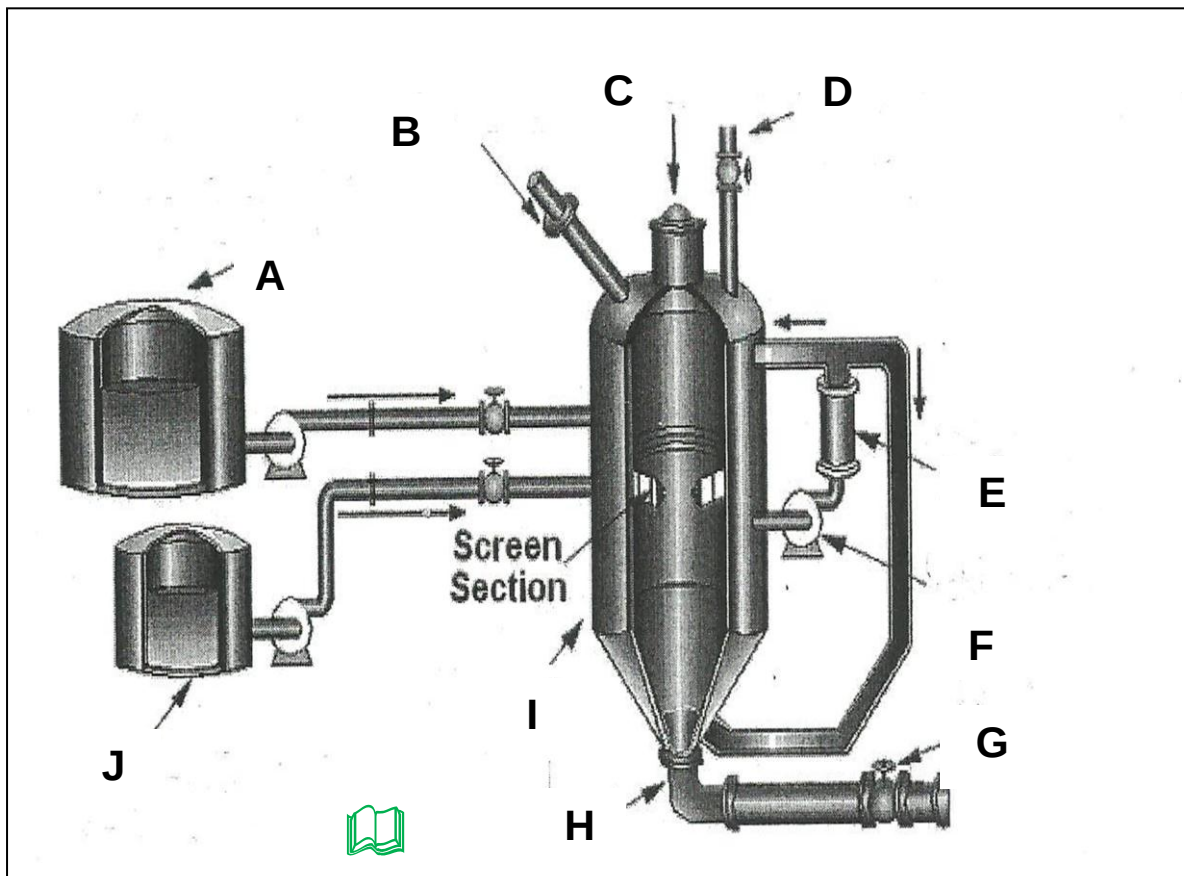
5.4 State THREE factors that influence bark removal.  (3)

5.5 Give FOUR examples of contaminants found in chips. (4)

[20]

QUESTION 6

6.1 Complete the diagram of a batch digester given below by naming the parts (A–J) in the ANSWER BOOK.



(10)

- 6.2 Define *cooking liquor*. (2)
- 6.3 Briefly discuss the production of unslaked lime. (7)
- 6.4  Give THREE reasons why chemical recovery was not used until 1930s. (3)
- 6.5 What is the advantage of using multiple-effect evaporators in a chemical recovery system? (2)
- [24]**

QUESTION 7

- 7.1 Describe the purpose of the approach flow system. (3)
- 7.2 State THREE primary functions of a press section.  (3)
- 7.3 Drying of the web is achieved by using forming, press and dry end sections.
- From the sections given above, answer the following:
- 7.3.1 Which section removes water from the web by thermal energy or evaporation process?
- 7.3.2 Which section uses mechanical compression to remove water from the web? 
- 7.3.3 Which section uses gravity or vacuum to remove water?
- 7.3.4 Which section consumes more energy than the others? (4 × 1) (4)
- 7.4 Define the *dry end section*. (2)
- 7.5 List FIVE combinations in extrusion lamination. (5)
- 7.6 What is the purpose of coating in the finishing process? (2)
- 7.7  Give FIVE advantages of water-borne adhesives in flexible packaging lamination. (5)
- [24]**

TOTAL SECTION B: 85
GRAND TOTAL: 100