higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PULP AND PAPERMAKING TECHNOLOGY
NQF LEVEL 3

(6050383)

2 March 2018 (X-Paper)
09:00–12:00

This question paper consists of 6 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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QUESTION 1

Indicate whether the following statements are TRUE or FALSE. Choose the answer and write 'true' or 'false' next to the question number (1.1–1.12) in the ANSWER BOOK. Correct the statements if they are false.

1.1 Once all logs are chipped and the right size and quality, they are taken to a place where they are stored.

1.2 Chipping is another step to ensure logs entering the wood yard to be properly sized and to ensure good quality.

1.3 Although logs come from the same place, there will still be differences between them.

1.4 Instead of removing bark by hand, machines called chip cleaners are used in the debarking process.

1.5 In a twin drum debarker the stave section helps to clean the removed bark from the drum.

1.6 If the debarker is not properly maintained, it can perform poorly therefor it should be sharpened regularly and its settings must be adjusted.

1.7 Screen plates are used during chip screening to ensure high quality woodchips.

1.8 Contraries that were not removed by the chip screening machine can also be removed during the pulping process.

1.9 A pulp washer is a machine that is used to clean the bagasse before it enters the depither.

1.10 The process of making pulp from bagasse begins with the removal of pith.

1.11 When bagasse is being prepared for pulp, pith and sludge are two important materials that are needed to strengthen pulp.

1.12 During the washing process, dispersants wash the ink from fibres, while detergents break the ink into fine particles and stop the ink from sticking to the fibres.

(12 × 2) **[24]**

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QUESTION 2

Choose a/an item from COLUMN B that matches a description/word in COLUMN A. write only the letter (A–K) next to the question number (2.1–2.10) in the ANSWER BOOK.

COLUMN A		COLUMN B	
2.1	When logs are stacked by placing them on top of each other	A	separators
2.2	In this equipment, fibres are broken down into loose stretchy fibres	B	yellowing
2.3	This process is mainly used for papers with large areas of ink e. g magazines and where surfactants are used	C	kraft pulping
2.4	These components or equipment remove finer particles while the screens remove larger particles	D	blow tank
2.5	Softens the chips for refining processes	E	flotation
2.6	The effectiveness of this pulping process depends on maximising lignin removal, minimizing fibre rejects and preventing fibres from dissolving in the cooking liquor	F	kraft pulping
2.7	This is a cylindrical vessel that stores the contents that goes into the digester and breaks up delignified chips	G	deflaker
2.8	In this semi chemical process, chemicals soften the chips into pulp	H	NSSC pulping process
2.9	Chemicals often used in this process include hydrogen peroxide, chlorine and sodium hypochlorite	I	stacking
2.10	This is a serious quality problem for bleached pulp	J	brightening
		K	pre steamer

(10 × 1) **[10]**

QUESTION 3

3.1 The grind stone can yield three different sizes of grit to produce different pulp products.

Tabulate these different grit sizes, the type of pulp they produce and their pulp products. (3 × 3) (9)

3.2 Describe ways in which the sharpness of the stone can affect the process. (3)

3.3 What effect will the following variables have on the digester pulp yield?

3.3.1 Cooking time too long

3.3.2 Digester temperature too high

3.3.3 Chip sizes vary greatly

3.3.4 Low liquor to wood ratio

3.3.5 Low chemical concentration

(5 × 1) (5)

3.4 Describe hydrochloric acid based process. (4)

3.5 How is the pulp stone sharpened? (3)

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QUESTION 4

4.1 Which TWO brightening processes that happens in the down flow towers? (2)

4.2 Name FOUR processes used in the production of chlorine dioxide for bleaching. (4)

4.3 Describe the operation of a rotary vacuum washer. (4)

4.4 Give FOUR quality requirements of bleached pulp. (4)

4.5 What is the difference between process control and quality control? (4)

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QUESTION 5

5.1 What is embossing? Give any TWO products that are made from embossed paper. (3)

5.2 Briefly explain how the embosser is designed. (4)

5.3 Describe how an embosser operates. (4)

5.4 What are the FOUR steps involved during the embossing process? (4)

5.5 Describe the operation of the blow tank (what happens to pulp from the point that it enters the blow tank to the point that it leaves the blow tank). (5)

5.6 How many washers does the counter current washing system consist of? (2)

5.7 Name TWO types of diffusion washers. (2)

[24]

TOTAL: 100

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