higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

PAPERMAKING N4

2 September 2021

This marking guideline consists of 4 pages.

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QUESTION 1

1.1 1.1.1 Hardwood
1.1.2 Softwood
(2 × 1) (2)

1.2 Bar length, bar angle, dams, grooves, cells – low intensity better fibrillation
(5 × 1) (5)

1.3 Diameter, cone angle, length, inlet, cons, pressure differential, temperature, reject rate (Any 6 × 1) (6)

1.4 Chemicals, air bubbles, froth-skimming (3)

1.5 Chute, two-pump system, trim, deluge showers, break conditions, broke chest
(Any 5 × 1) (5)
[21]

QUESTION 2

2.1 2.1.1 Plays a critical role in balancing pressure across headbox (1)

2.1.2 Sketch must include tape, recirculation, valve adjusted to balance pressure, sight glass to view fibre flow (4)

2.2 Discussion on either air flow for total head and stock flow for level, or vice versa. (5)
Drawing showing level transmitter, air supply, interlocks

2.3 2.3.1 Drawing showing breast roll, top wire, bottom wire, foils, table rolls, vacuum boxes, couch, wire rolls, stretch roll, guide roll (10 × ½) (5)

2.3.2 Function of each component shown on drawing clearly described (6 × ½) (3)

2.4 2.4.1 Water doctored off; vacuum pulse pulls water (1)

2.4.2 Foil angle, spacing, removal/addition of blades (2)

2.4.3 Water removal rate, formation, retention (2)
[23]

QUESTION 3

3.1		Pd between stern and Guy Chapman layer to control chemical dosage	(3)
3;2	3.2.1	Better retention – critical for neutral/alkaline papermaking	(2)
	3.2.2	Cationic part to suction side of fan pump, anionic part before headbox	(4)
3.3	3.3.1	Accumulation on machine, holes in sheet	(2)
	3.3.2	Adhesives, hot melts, wood	(1)
			[12]

QUESTION 4

4.1		Drawing must include pick-up roll, first press suction roll and felt, granite roll, second press roll and felt, third press roll and felt, hp and lubrication showers, vacuum box	(8)
4.2		Nip load/Speed, high impulse improve water removal	(2)
4.3		Drawing must include main steam supply, main, intermediate, wet end, separators, header, differential pressure control, vacuum system	
		Discussion on differential pressure control and interlocks.	(9)
			[19]

QUESTION 5

5.1		Porosity, speed, ingoing moisture, starch solids, load	(4)
5.2	5.2.1	High at start, zero load diameter	(3)
	5.2.2	Front drum higher at start, crossover diameter	(3)
	5.2.3	High tension increases density	(1)
			[11]

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QUESTION 6

6.1	Measurement of reflectance/show-through	(2)
6.2	Calendaring, ash content, refining	(3)
		[5]

QUESTION 7

7.1	Headbox, breast roll, dandy, hp, trim, knock off, wire roll each)	(½ mark	(4)
7.2	Roll width, speed, roll cover, rigid back, angle, load, blade material		(5)
			[9]
		TOTAL:	**100**

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