



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

**NATIONAL CERTIFICATE
WATER TREATMENT PRACTICE N3**

(8120033)

**21 November 2022 (X-paper)
09:00–12:00**

This question paper consists of 4 pages and 1 periodic table.

120Q1E2221

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA
NATIONAL CERTIFICATE
WATER TREATMENT PRACTICE N3
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. Use only a blue or black pen.
 5. The sketch should be clear, neat and labelled. A pencil may be used.
 6. Write neatly and legibly.
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QUESTION 1

Complete and balance the following chemical reactions:



[10]

QUESTION 2

2.1 Define the following terms:

2.1.1 Filtration

2.1.2 Breakpoint

2.1.3 Coagulant

2.1.4 Turbidity

(4 × 2) (8)

2.2 Calculate the molecular mass of the following compounds:

2.2.1 Ferric hydroxide

2.2.2 Carbon monoxide

2.2.3 Limestone

2.2.4 Magnesium sulphate

(4 × 3) (12)
[20]



QUESTION 3

- 3.1 Explain the purpose of each of the following in the backwashing process of a rapid sand filter: 
- 3.1.1 Air blower (3)
- 3.1.2 Wash water (4)
- 3.2 Compounds which dissolve in water usually separate into positively and negatively charged ions.
- Use sodium chloride to explain the phenomenon of ionisation. (7)
- 3.3 Name FOUR methods of iron removal. (4)
- 3.4 Name THREE types of sedimentation tanks. (3)
- [21]**
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QUESTION 4

- 4.1 Make a sketch to show how the process of the pressure sand filter works. (10)
- 4.2 State THREE methods of chlorination. (3)
- 4.3 State FOUR definite regions in a breakpoint chlorination curve. (4)
- 4.4 Give the formula that is used to calculate pHs (stability of water). (2)
- [19]**

QUESTION 5

- 5.1 State SIX precautions that can be taken to prevent rusting. (6)
- 5.2 State THREE disadvantages of the lime soda process. (3)
- 5.3 Name THREE types of fluoride used in water treatment to prevent dental damage. (3)
- 5.4 Name FOUR classes of fire, give ONE example of each class and name the type of extinguisher used for each class of fire. (8)
- 5.5 State 10 types of information that should be supplied when samples are submitted for testing. (10)
- [30]**
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TOTAL: 100

KEY/SLEUTEL																	
Atomic number Atoomgetal																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
(I)	(II)											(III)	(IV)	(V)	(VI)	(VII)	(VIII)
1 H 1,01	2 He 4																
3 Li 6,94	4 Be 9																
11 Na 23	12 Mg 24																
19 K 39	20 Ca 40	21 Sc 45	22 Ti 48	23 V 51	24 Cr 52	25 Mn 55	26 Fe 56	27 Co 59	28 Ni 59	29 Cu 63,5	30 Zn 65	31 Ga 70	32 Ge 73	33 As 75	34 Se 79	35 Br 80	36 Kr 84
37 Rb 86	38 Sr 88	39 Y 89	40 Zr 91	41 Nb 92	42 Mo 96	43 Tc 98	44 Ru 101	45 Rh 103	46 Pd 106	47 Ag 108	48 Cd 112	49 In 115	50 Sn 119	51 Sb 122	52 Te 128	53 I 127	54 Xe 131
55 Cs 133	56 Ba 137	57 La 139	58 Ce 140	59 Pr 141	60 Nd 144	61 Pm	62 Sm 150	63 Eu 152	64 Gd 157	65 Tb 159	66 Dy 163	67 Ho 165	68 Er 167	69 Tm 169	70 Yb 173	71 Lu 175	72 Hf 179
87 Fr 226	88 Ra 226	89 Ac	90 Th 232	91 Pa 231	92 U 238	93 Np 237	94 Pu 244	95 Am 243	96 Cm 247	97 Bk 247	98 Cf 251	99 Es 252	100 Fm 257	101 Md 288	102 No 289	103 Lr 260	104 Ta 181
Electronegativity Elektronegatiwiteit Symbol Simbool Approximate relative atomic mass Benaderde relatiewe atoommassa 29 Cu 63,5																	