higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

CONCRETE STRUCTURES
NQF LEVEL 4

(12020514)

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

This question paper consists of 5 pages.

439Q1N2217

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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 black or blue pen.
5. Write neatly and legibly.

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QUESTION 1

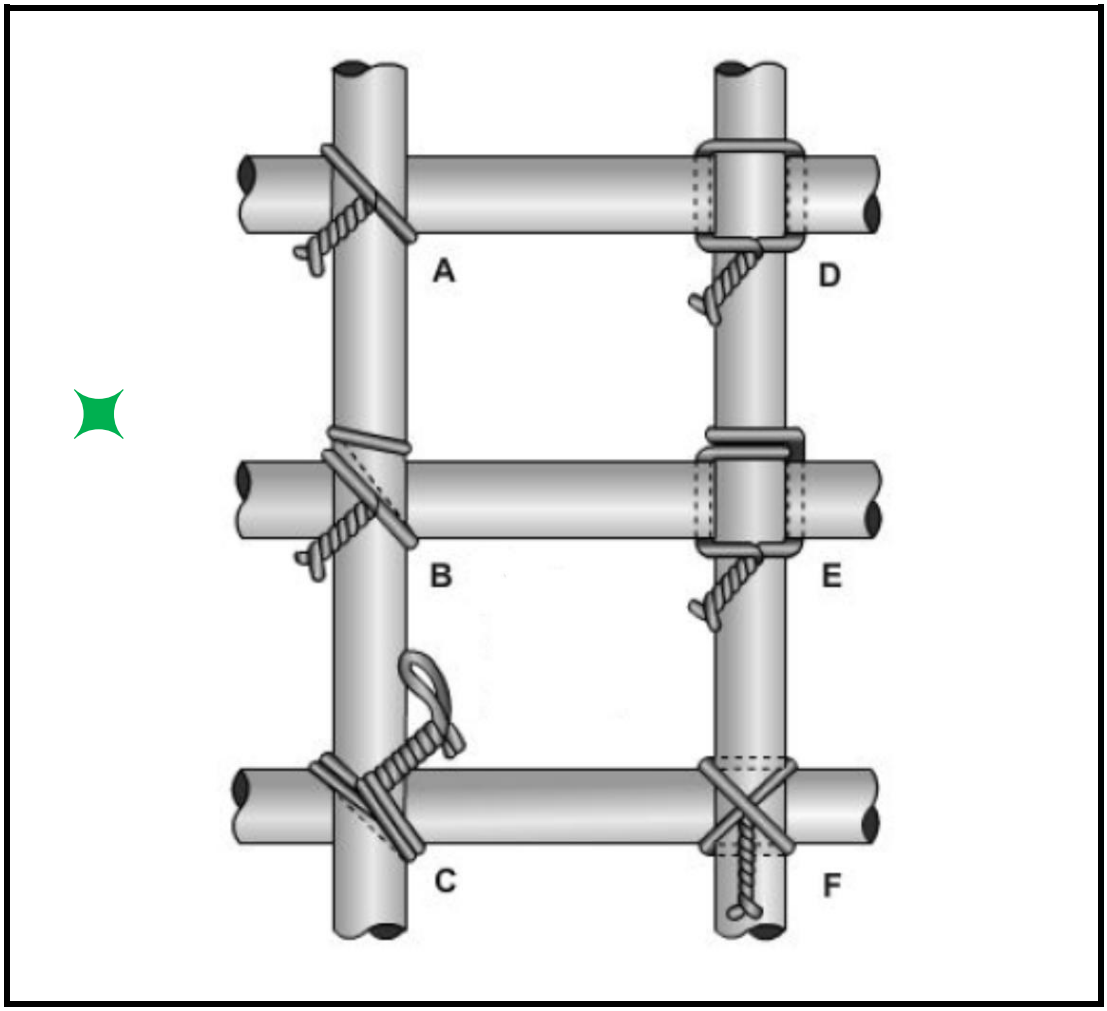
Choose a term from COLUMN B that matches a description in COLUMN A. Write only the letter (A–K) next to the question number (1.1–1.10) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.1	Compound of chlorine with another element or group	A	carbonation
1.2	Chemical weathering process where carbon gas is dissolved in a liquid	B	chloride
1.3	One of a class of substances that neutralise and are neutralised by acids, e.g. an oxide of the lime group	C	passivation
1.4	Results in a ferric oxide film or thin layer that forms on steel protecting it against corrosion	D	alkali
1.5	Surface layer of ferric oxide that forms on steel or iron during hot rolling	E	hydration
1.6	Chemical process that occurs during the hardening of concrete	F	mill scale
1.7	Process where concrete is kept moist or wet to ensure that the chemical process occurs when cements sets and hardens	G	impervious
1.8	Not allowing fluids to pass through	H	curing
1.9	Relatively ductile and can easily bend when dropped	I	epoxy coated
1.10	Coated steel bar that must not be dropped into objects	J	mild steel
		K	dunnage

(10 × 1) **[10]**

QUESTION 2

2.1 The image below shows several types of ties on bars.



Identity each type of tie and write down the steps to follow when tying each bar. (19)

2.2 Briefly explain FOUR factors to keep in mind before tying reinforcements. (12)

2.3 Name TWO special types of pliers used to fix steel. (2)

2.4 Name the material used to tie reinforcement bars together. (1)

2.5 Complete the following sentence by writing only the missing word or words next to the question number (2.5) in the ANSWER BOOK.

A metal that can be (2.5) … out of shape without returning to its original shape is supple, flexible, pliable and the opposite of rigid. (1)

[35]

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QUESTION 3

3.1 Explain TWO important methods used to cure concrete in construction. (2)

3.2 State THREE ways of cleaning contaminated reinforcement. (3)

3.3 Give FIVE advantages of using a good release agent. (5)
[10]

QUESTION 4

4.1 Distinguish between the mixing time of a *drum-type mixer* and a *pan-type mixer* when using a batch size of 1,5 m³. (5)

4.2 List SEVEN signs that indicate problems or dangers with formwork and false work during a pouring of concrete. (7)

4.3 Give EIGHT reasons why entrapped air must be removed from concrete. (8)

4.4 Briefly explain each of the following terms:

4.4.1 Consistence (1)

4.4.2 Cohesiveness (2)

4.4.3 Blowholes (2)
[25]

QUESTION 5

Define each of the following terms:

5.1 Creep

5.2 Extenders

5.3 Plasticisers

5.4 Cube test

5.5 Slump test

(5 × 2) **[10]**

QUESTION 6

6.1 List FIVE methods that can be used to organise and store small components. (5)

6.2 Explain why panels are best stored horizontally on a flat base and covered with waterproofing. (5)
[10]

TOTAL: 100

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