higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING FABRICATION: SHEETMETAL WORK
NQF LEVEL 3

(6031023)

16 November 2022 (X-Paper)
09:00–12:00

This question paper consists of 11 pages.

387Q1N2216

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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. Start each question on a new page.
5. Use only a blue or black pen.
6. Write neatly and legibly.

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SECTION A

QUESTION 1

1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1.1–1.1.6) in the ANSWER BOOK.

1.1.1 This material contains mainly iron and a small proportion of other metals, and corrodes rapidly unless protected.

A Non-ferrous metals
B Non-ferrous alloys
C Ferrous metals
D Ferrous alloys

1.1.2 A metric calibrated tape measure indicates certain measurements.

Which ONE of the following measurements is not indicated on it?

A 1 millimetre
B 1 centimetre
C 1 inch
D 1 metre

1.1.3 Safety signs are divided into groups. An abbreviation identifies each group.

Which ONE of the following abbreviations indicates the group of informative signs?

A WW
B GA
C MV
D PV

1.1.4 Which of the following abbreviations represents stick welding?

A GTAW
B MAG
C MIG
D SMAW

1.1.5 Scale 1:5 means the following:

A The object's length must be 5 times shorter than in the plan drawing.
B The object's width must be 5 times smaller than in the plan drawing.
C The object must be 5 times bigger than in the plan drawing.
D The object must be 5 times smaller than in the plan drawing.

1.1.6 One of the rules a crane driver must obey is to …

A swing a load over the heads of other staff.
B drag or push a load during the slewing motion.
C switch off the machine with a load in suspension.
D always ensure that the handbrake is on when a load is hoisted.

(6 × 1) (6)

1.2 Complete the following sentences by filling in the missing word or words. Write only the missing word or words next to the question number (1.2.1–1.2.6) in the ANSWER BOOK.

1.2.1 The term *plumb* means …

1.2.2 A … calliper is moved along the face of a workpiece so that a straight line is scribed parallel to the reference face.

1.2.3 A gas welding torch can also be called a …

1.2.4 A … can be identified by the flame that goes out, and there is a loud squealing or hissing noise at the tip of the gas welding torch.

1.2.5 It is critical to calculate the … to determine the correct size of a flat pattern.

1.2.6 A load is usually coupled to the crane hook by …

(6 × 1) (6)

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1.3 Choose a term from COLUMN B that matches a description in COLUMN A. Write only the letter (A–L) next to the question number (1.3.1–1.3.6) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.3.1	The carbon content of this type of steel ranges from 0,5% to 0,8%	A	tool steel
		B	outside callipers
1.3.2	To read the size measured with this calliper, you need to hook the one leg at the edge of a ruler	C	detail drawings
		D	match stick
		E	high-carbon steel
1.3.3	To reduce the chance of getting burned when lighting the oxy-fuel torch, you must use this equipment	F	close the fuel gas torch valve
		G	arm extended, fingers closed, thumb up, move arm up and down
1.3.4	During the dismantling process of the oxy-fuel system, this is the first step to take	H	inside callipers
		I	striker
		J	sectional drawings
1.3.5	These drawings are used to clarify specific features of the HVAC plan	K	close the fuel gas cylinder valve
		L	forearm vertical, make small horizontal circle with hand
1.3.6	This hand signal means 'Derrick jib up'		

(6 × 1) (6)

1.4 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (1.4.1–1.4.6) in the ANSWER BOOK.

1.4.1 A new file should only be used on softer materials during the breaking-in period.

1.4.2 The combination set can be used to measure the depth of a hole.

1.4.3 Effective flame shape and heat values can be maintained only if the nozzle hole is clean and square with the end of the nozzle.

1.4.4 The toe of a welding bead is formed at the spot where the bead-face connects with the parent metal.

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1.4.5 By considering indicators such as the type of metal, the bend radius and material thickness, you will be able to determine the appropriate bending allowance.

1.4.6 A helical wound means that a rope is wound like the thread of a screw.

(6 × 1) (6)

1.5 Complete the following sentences by using the words provided in the list below. Write only the word or words next to the question number (1.5.1–1.5.6) in the ANSWER BOOK.

WLL; assistant; prick punch; GTAW; flat screwdriver; oil; Phillips screwdriver; centre punch; no lubricant; SMAW; crane driver; SWL

1.5.1 A … is used to turn star head screws.

1.5.2 A … is used to mark scribed lines on a plate for better viewing.

1.5.3 … must be applied to oxygen valves and fittings.

1.5.4 … generates an arc between a non-consumable tungsten electrode and a base metal.

1.5.5 A … has to ensure that the tyre pressure of a mobile crane is correct.

1.5.6 … indicates the maximum load that should be applied to a chain.

(6 × 1) (6)

[30]

TOTAL SECTION A: 30

SECTION B

QUESTION 2

2.1 List THREE types of hammers used in a workshop for general purposes. (3)

2.2 Screwdrivers are classified according to two features.

State the TWO features. (2)

2.3 Describe any FOUR guidelines for the safe use of a screwdriver. (4 × 2) (8)

2.4 Describe the use of the following hand tools:

2.4.1 Vice-grip pliers

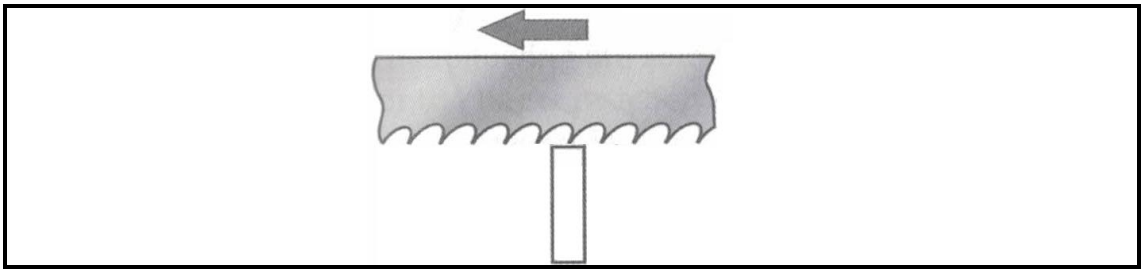
2.4.2 Side cutter

2.4.3 Water pump pliers

2.4.4 Slip-joint pliers

(4 × 2) (8)

2.5 Study the figure below and name the stroke indicated by the arrow.



(1)

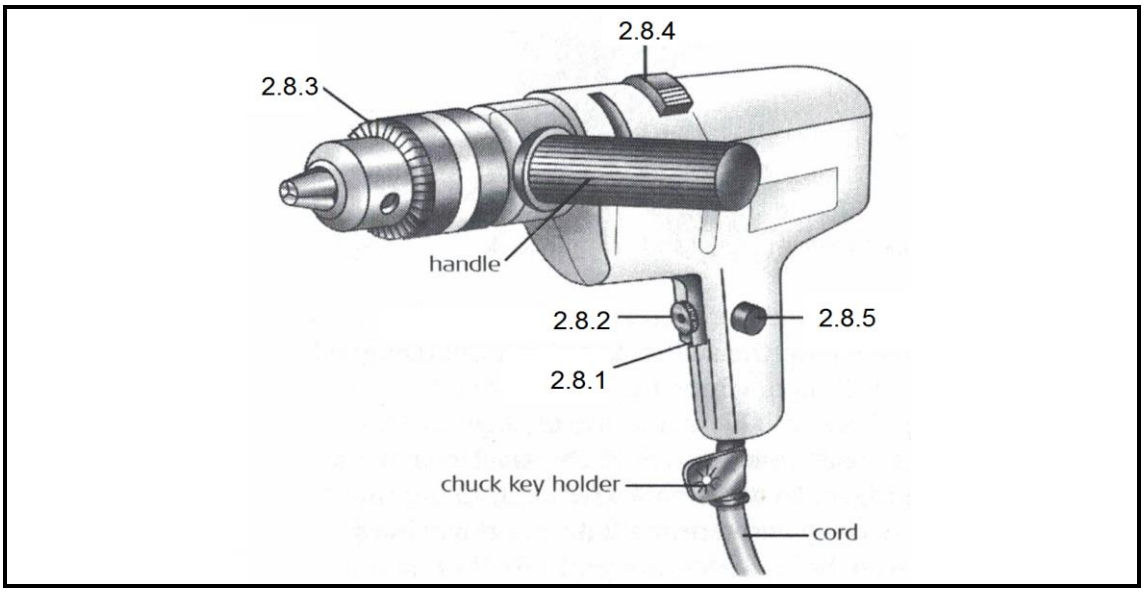
2.6 When inspecting a hacksaw blade, you will notice the following: 32T.

Explain what it means. (2)

2.7 Hacksaw blades with the following indicators are available from the storeroom: 14TPI, 18TPI, 24TPI and 32TPI.

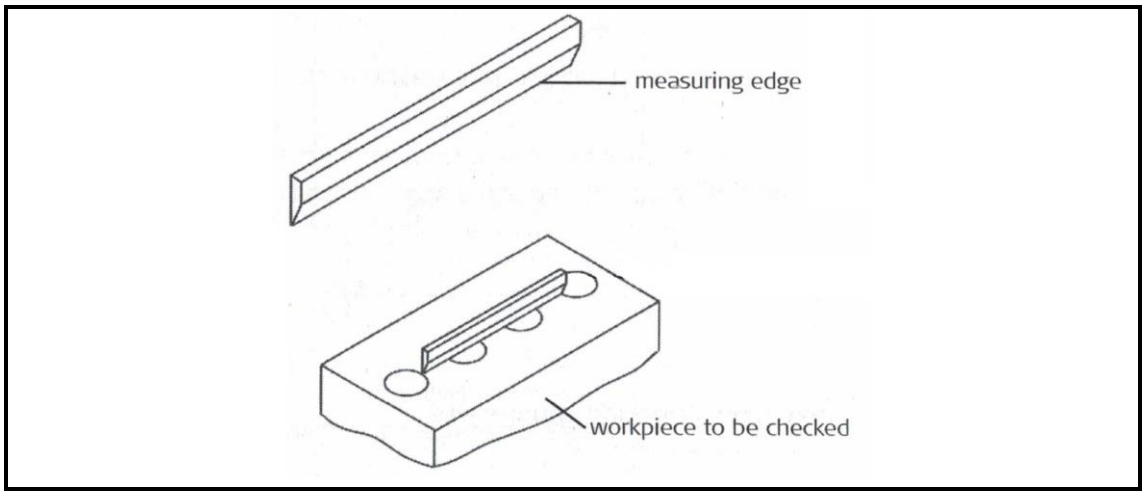
Which blade will be the most effective to saw a flat bar that is 10 mm thick? (1)

2.8 Label the indicated parts of the following tool by writing only the answers next to the question number (2.8.1–2.8.5) in the ANSWER BOOK.



(5)

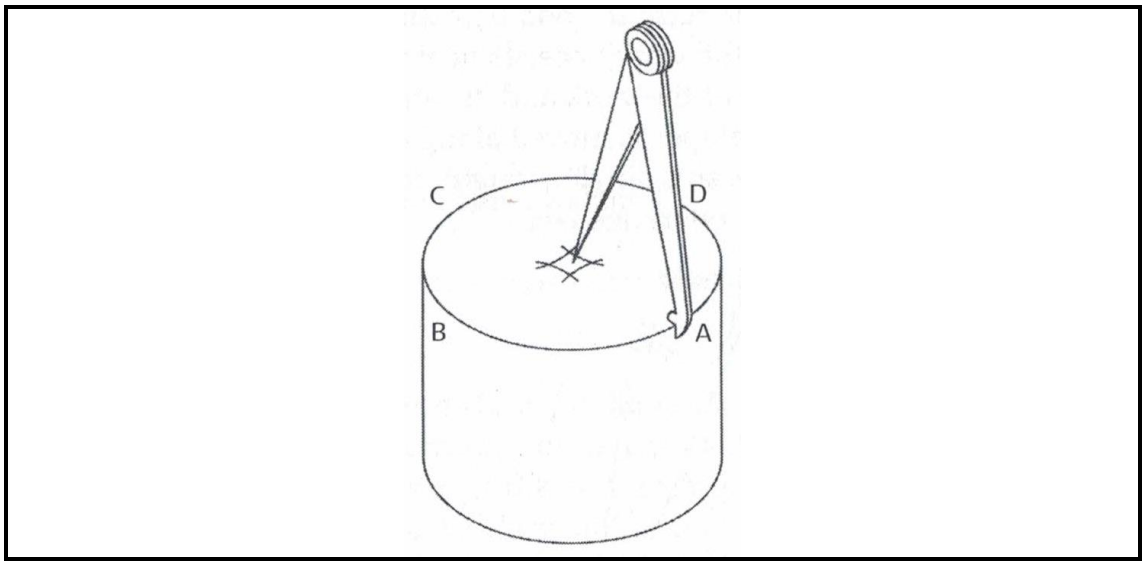
2.9 Below is an illustration of a tool for checking a workpiece.



2.9.1 Name the tool. (1)

2.9.2 Describe the process. (2)

2.10 Below is an illustration of a tool for marking off a round object.



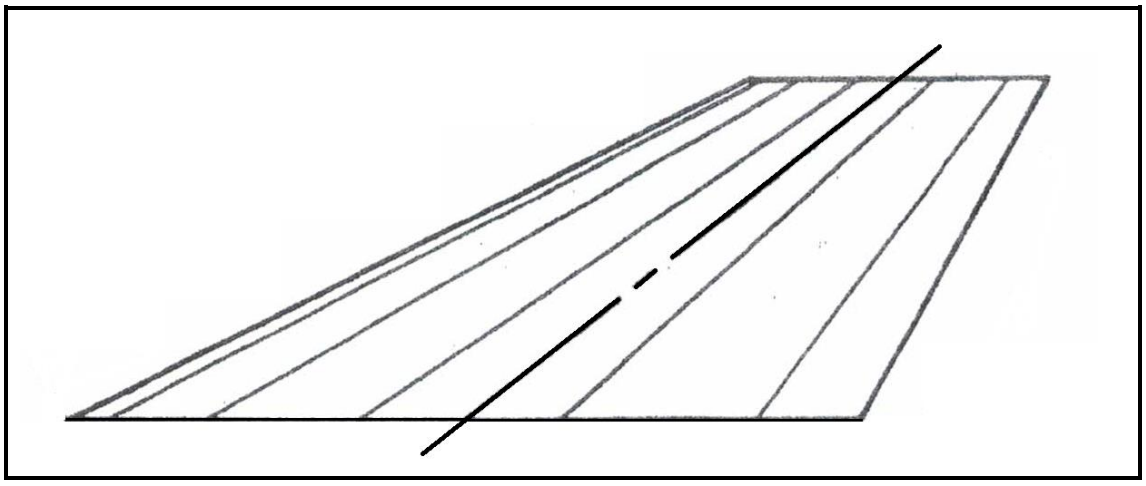
2.10.1 Name the tool. (1)

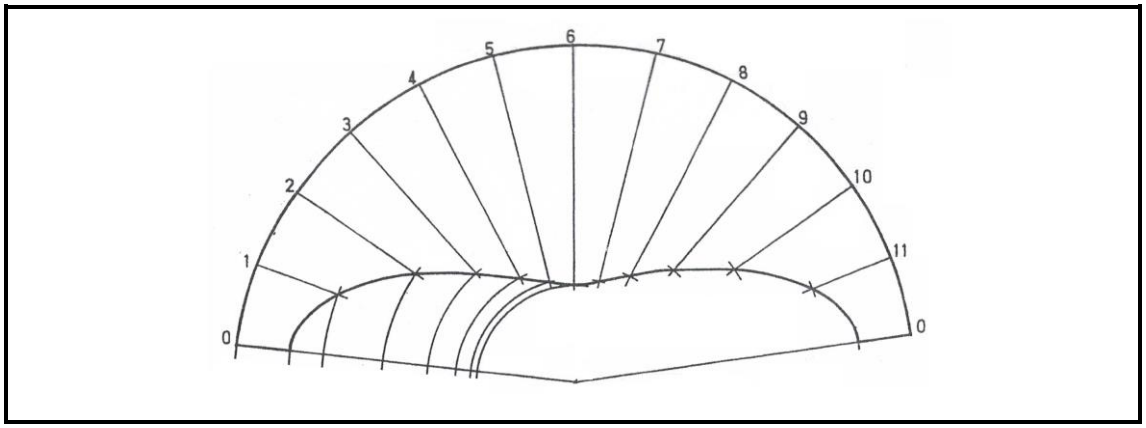
2.10.2 Describe the purpose of the markings on the round bar. (2)

2.11 Draw a line 50 mm long and bisect it by means of construction. Show all construction lines. (3)

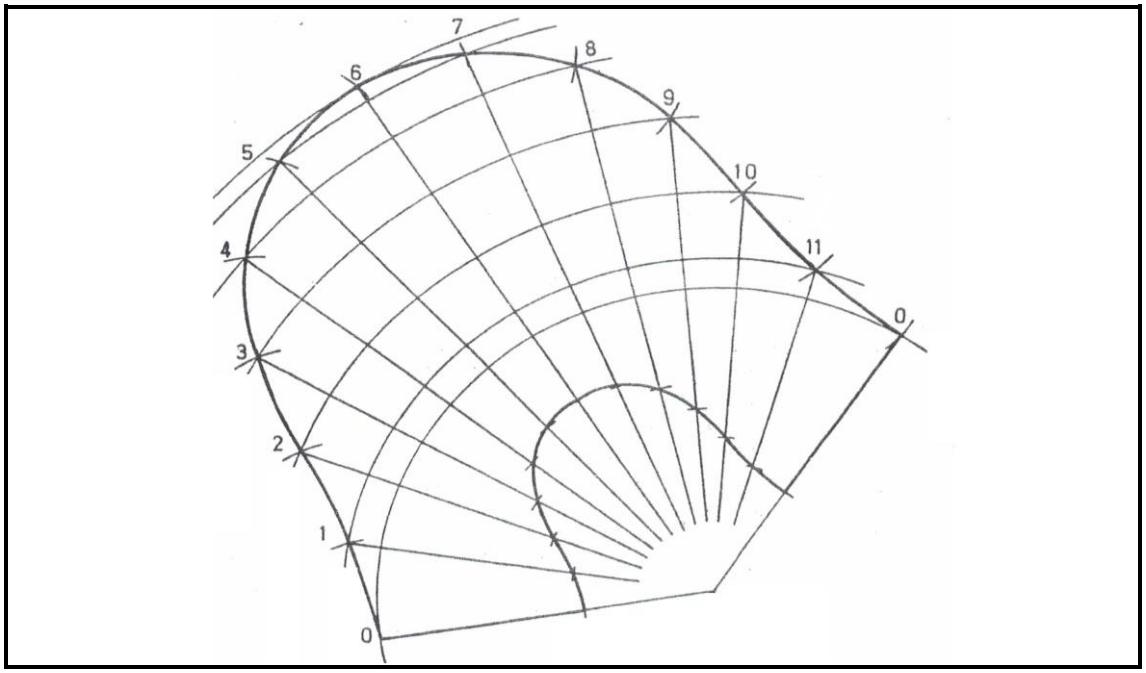
2.12 Draw any obtuse angle with line lengths of 50 mm. Bisect the angle by means of construction. Show all construction lines. (4)

2.13 The following is a drawing of a certain type of cone. Analyse the drawing and choose the correct development option for this cone. (2)





DEVELOPMENT OPTION 1



DEVELOPMENT OPTION 2

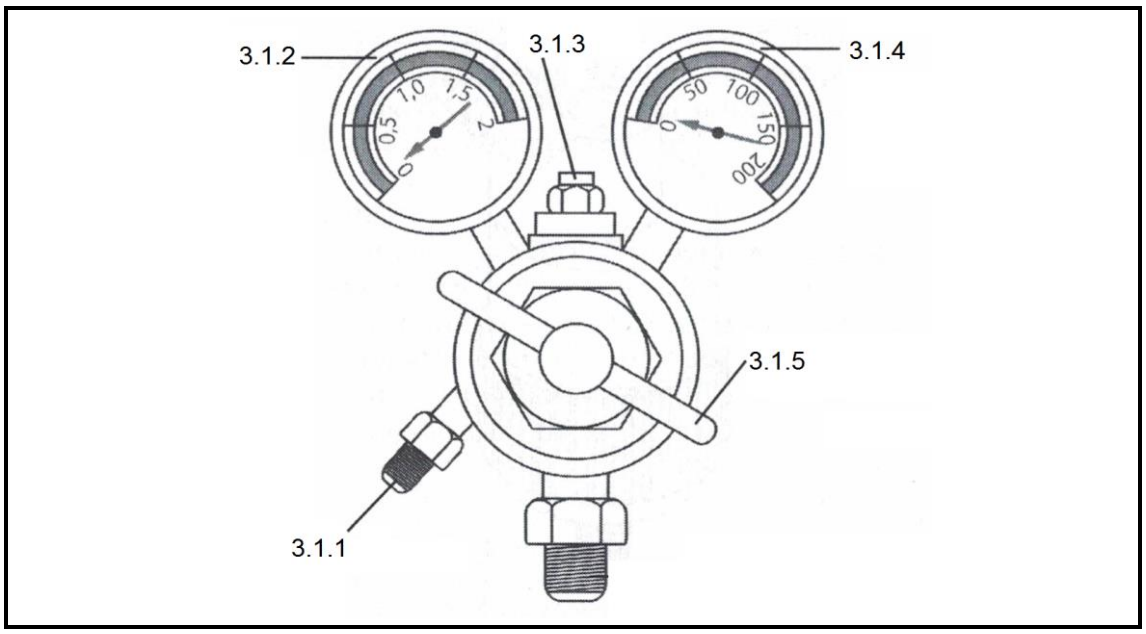
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2.14 List any FIVE drawing specifications that must be adhered to when parts are shaped and assembled. (5)

[50]

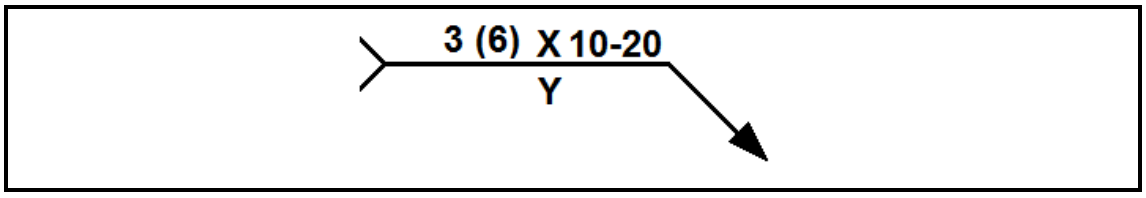
QUESTION 3

3.1 Below is an illustration of a pressure regulator. Label the indicated parts by writing only the answers next to the question number (3.1.1–3.1.5) in the ANSWER BOOK. Labels must be specific to the component.



(5)

3.2 The following weld symbol indicates certain welding symbols in specific positions.



Explain the meaning of each of the following indicators:

3.2.1 3

3.2.2 (6)

3.2.3 10

3.2.4 20

3.2.5 Y

(5 × 1) (5)

[10]

QUESTION 4

4.1 The following are common HVAC symbols. Study the symbols and write their names next to their numbers (4.1.1–4.1.4) in the ANSWER BOOK.

4.1.1 

4.1.2 

4.1.3 

4.1.4 

(4 × 1) (4)

4.2 List any SIX types of PPE that are commonly used in a workshop. (6)
[10]

TOTAL SECTION B: 70
GRAND TOTAL: 100

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