higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

PLATERS' THEORY N2

(11022182)

6 August 2021 (X-paper)
09:00–12:00

Drawing instruments and nonprogrammable calculators may be used.

This question paper consists of 6 pages.

227Q1G2106

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
PLATERS' THEORY N2
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. Only use a black or blue pen.
6. Write neatly and legibly.

QUESTION 1: MACHINES

1.1 Briefly explain the operating principle of a guillotine. (3)

1.2 Briefly explain the use of a plate-bending roll machine. (2)

1.3 FIGURE 1 shows a radial drilling machine.

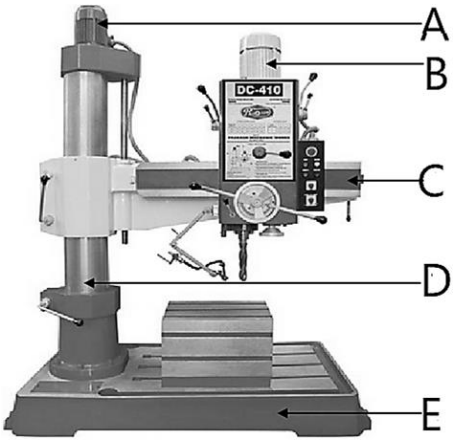

FIGURE 1

Label the radial drilling machine by writing only the answer next to the letter (A–E) in the ANSWER BOOK. (5 × 1) (5)

[10]

QUESTION 2: ROLLING AND BENDING

2.1 Briefly explain how a pyramid-bending roll bends a plate. (5)

2.2 FIGURE 2 shows a sectional view of a rolled steel joist.

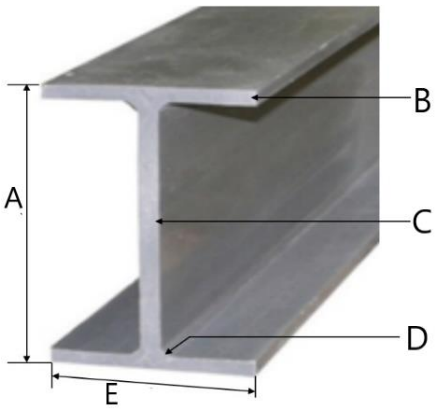

FIGURE 2

Label the rolled steel joist by writing only the answer next to the letter (A–E) in the ANSWER BOOK. (5 × 1) (5)

[10]

QUESTION 3: JOINING OF STEEL SECTIONS

3.1 What is a *jig*? (3)

3.2 Give SEVEN advantages of a well-designed welding jig. (7)
[10]

QUESTION 4: GENERAL PIPEWORK

4.1 FIGURE 3 shows an outside view of a combination square.

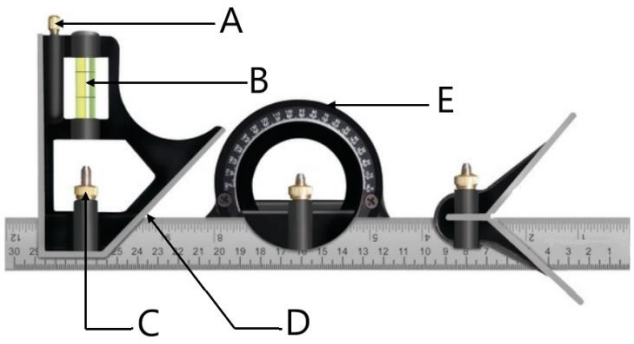

FIGURE 3

Label the combination square by writing only the answer next to the letter (A–E) in the ANSWER BOOK. (5 × 1) (5)

4.2 Explain, with the aid of a sketch, the term *two holes on top* as it relates to pipe flanges and indicate the pitch-circle diameter (PCD) on the flange. (3)
[8]

QUESTION 5: STEEL SRUCTURES

FIGURE 4 shows a simple roof truss.

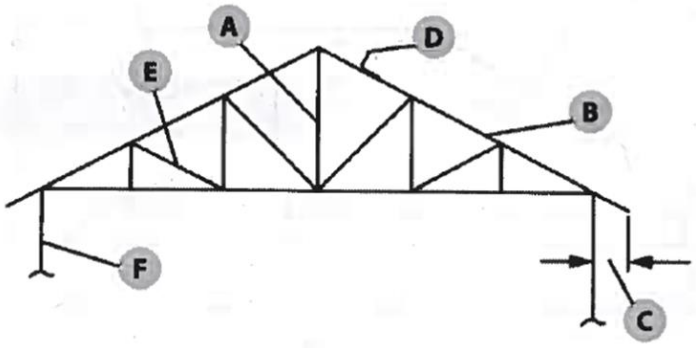

FIGURE 4

Label the steel roof truss by writing only the answer next to the letter (A–F) in the ANSWER BOOK. (6 × 1) **[6]**

QUESTION 6: TEMPLATES

List EIGHT pieces of information that should be indicated on a template. **[8]**

QUESTION 7: METALS

7.1 Differentiate between *ferrous metals* and *nonferrous metals*. (2)

7.2 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 (7.2.1–7.2.4) in the ANSWER BOOK.

7.2.1 Mild steel is also known as a … steel.

A low-carbon
B medium-carbon
C high-carbon
D tungsten-alloy

7.2.2 Tungsten, nickel, chromium, vanadium and manganese are all …

A ferrous metals.
B nonferrous metals.
C metal.
D alloy elements.

7.2.3 The process to reduce brittleness is called …

A hardening.
B tempering.
C quenching.
D normalising.

7.2.4 The purpose of annealing is to … the metal.

A harden
B temper
C soften
D cool

(4 × 2) (8)
[10]

QUESTION 8: GAS WELDING AND CUTTING

8.1 Explain the use of each of the following:

8.1.1 Flame cleaning nozzles

8.1.2 Pressure gauge on a cylinder

(2 × 2) (4)

8.2 Briefly explain the operating principle of a straight-line gas cutting machine. (4)

[8]

QUESTION 9: ARC WELDING

9.1 Briefly explain each of the following welding terms without using drawings:

9.1.1 Run

9.1.2 Parental metal

9.1.3 Welding face

9.1.4 Backing bar

(4 × 2) (8)

9.2 Briefly explain the term *undercut*. (3)

9.3 Name FOUR causes of undercut. (4)

[15]

QUESTION 10: CALCULATION AND PLANNING

Calculate the mass of the plate needed to manufacture a tank.

The following data is available:

Inside diameter = 1,58 m
Height = 1,65 m
Thickness of plate = 20 mm
1 mm plate = 7,85 kg/m²

NOTE: Circumference of a cylinder = 3,142 × mean diameter of cylinder
Area of a circle = 3,142 × r²

[15]

TOTAL: 100