higher education
& training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

PLATERS' THEORY N2

(11022182)

9 April 2020 (X-paper)
09:00–12:00

Drawing instruments and nonprogrammable calculators may be used.

This question paper consists of 6 pages.

219Q1A2009

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.   Use only a black or a blue pen.

5.   Write neatly and legibly.

QUESTION 1: MACHINES

1.1   Briefly describe the working principle of a guillotine.   (4)

1.2   Briefly describe the use of a box and pan folding machine.   (4)

1.3   State TWO safety precautions to be observed when working with a pedestal
        grinding machine.   (2)
                                                                                              [10]

QUESTION 2: ROLLING AND BENDING

2.1   The diameter of a 45 × 45 × 4 mm external angle-iron ring, measured across
        the heel of the angle iron, is 0,8 m.

        Calculate the length of the angle iron required to form the ring using the
        formula below:

        $L = [D + T + (T ÷ 3)] π$

        Where :   L = Length of the angle iron
                    T = Thickness of the angle iron
                    D = Heel diameter of ring   (5)

2.2   Briefly describe how pyramid rolls bend a plate. Do not use a drawing in your
        explanation.   (5)
   **[10]**

QUESTION 3: JOINING OF STEEL PROFILES

3.1   State FOUR advantages of using a well-designed assembly jig.   (4)

3.2   Name THREE requirements with which a well-designed welding jig should
        comply.   (3)

3.3   Make a neat, freehand drawing to show a method to join an angle iron to an
        H-profile.   (3)
                                                                                              [10]

QUESTION 4: GENERAL PIPEWORK

4.1 FIGURE 1 shows the outside view of a centre finder.

Name the parts indicated in FIGURE 1 by writing only the answer next to the letter (A–D) in the ANSWER BOOK.
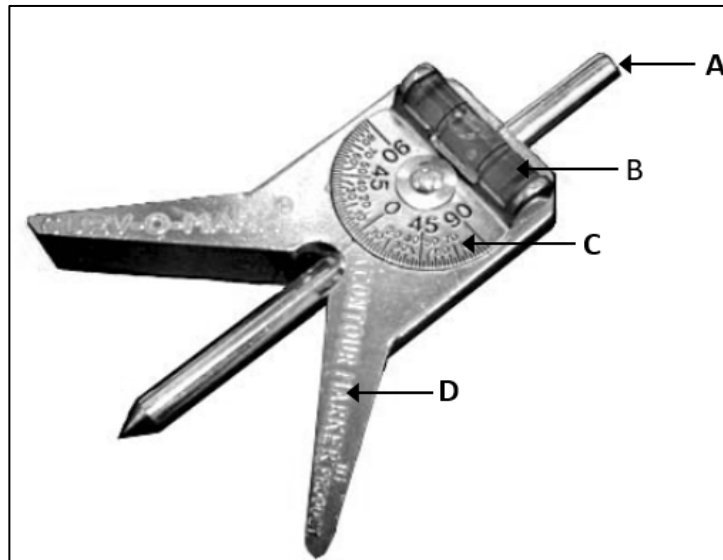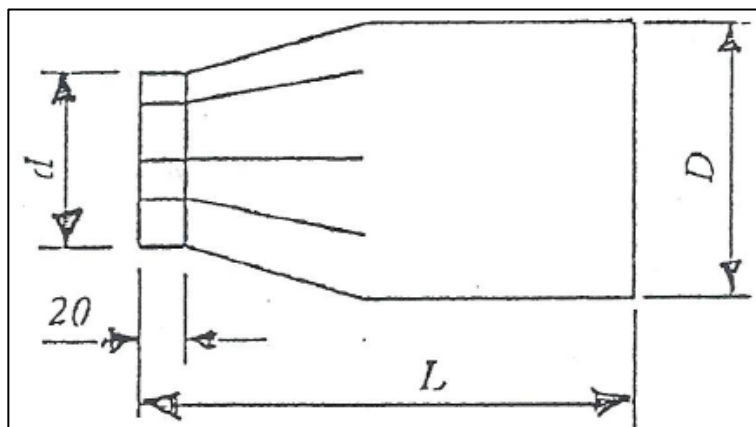

FIGURE 1 (4)

4.2 FIGURE 2 shows a pipe reducer.

Briefly describe how to go about marking off a pipe for cutting when making a pipe reducer.

FIGURE 2 (6)

[10]

QUESTION 5: STEEL STRUCTURE

The span of a simple roof truss is 8 m and the length of the rafter is 4,472 m.

Calculate the following:

5.1 Rise

5.2 Pitch

(2 × 3) **[6]**

QUESTION 6: TEMPLATES

6.1 Briefly discuss the use of templates made from the following materials:

    6.1.1 Template paper

    6.1.2 Timber

(2 × 2) (4)

6.2 Give TWO reasons for the use of a template. (2)
[6]

QUESTION 7: METALS

7.1 Briefly explain the function of annealing as applied to a heat-treatment process. (2)

7.2 Explain FOUR positive effects the following elements have on the change of properties of steel when they are alloyed:

    7.2.1 Nickel

    7.2.2 Chrome

(2 × 4) (8)
[10]

QUESTION 8: GAS WELDING AND CUTTING

8.1   Briefly state the adverse effects of the following when doing gas cutting or welding:

      8.1.1   Laminated plates

      8.1.2   Scales

      8.1.3   Paint

      8.1.4   Oxide on the surface

                                                     (4 × 2)   (8)

8.2   Briefly explain the working principle of the straight line gas cutting machine.   (2)
                                                           [10]

QUESTION 9: ARC WELDING

9.1   Briefly explain the following welding terms:

      9.1.1   Bevel angle

      9.1.2   Groove angle

      9.1.3   Deposited metal

      9.1.4   Electrode

                                                     (4 × 2)   (8)

9.2   State FOUR causes of poor penetration when welding.   (4)
                                                             [12]

QUESTION 10: CALCULATION AND PLANNING

Calculate the mass of a 6 mm thick metal plate required to make up 30 trays of 400 mm length, 200 mm width and 60 mm depth.

The mass of 1 mm thick plate = 7,85 kg/m²   **[16]**

                                                        TOTAL: **100**