T1320(**E**)(A6)T

NATIONAL CERTIFICATE

PLATERS' THEORY N2

(11022182)

6 April 2018 (X-Paper)
09:00–12:00

A nonprogrammable calculator may be used.
Candidates will need drawing instruments.

This question paper consists of 7 pages.

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. Freehand drawings must be done in pencil and must be neat and reasonably large.

5. Write neatly and legibly.

QUESTION 1: MACHINES AND SAFETY

1.1   Redraw the table below in your ANSWER BOOK and arrange the following unsafe situations in the correct columns:

        1.1.1   Bad factory layout and badly marked walkways

        1.1.2   Leaving a machine running unattended

        1.1.3   Machining an unclamped workpiece

        1.1.4   Crowded workshop

UNSAFE ACT		UNSAFE CONDITION	

                                      (4 × 1/2)   (2)

1.2   State at least TWO main reasonsfor using colour coding in the workshop.   (2)

1.3   What colour would be used to indicate the following in the workshop:

        1.3.1   Firefighting equipment

        1.3.2   Oil equipment

                                      (2 × 1)   (2)

1.4   Explain the function of interlocking guards as used in machines in aworkshop.   (2)

1.5   State ONE safety precaution for each of the following machines:

        1.5.1   Huckbolt

        1.5.2   Punching

                                        (2 × 1)   (2)

                                                     [10]

QUESTION 2: ROLLING, BENDING AND STRAIGHTENING MACHINE

2.1   Explain the function of a hammer and anvil when using this machine.   (2)

2.2   Draw and briefly explain the basic principle of three pyramidal rollers during cylinder rolling.   (4)

2.3   Draw and label an unequal-leg angle iron showing:
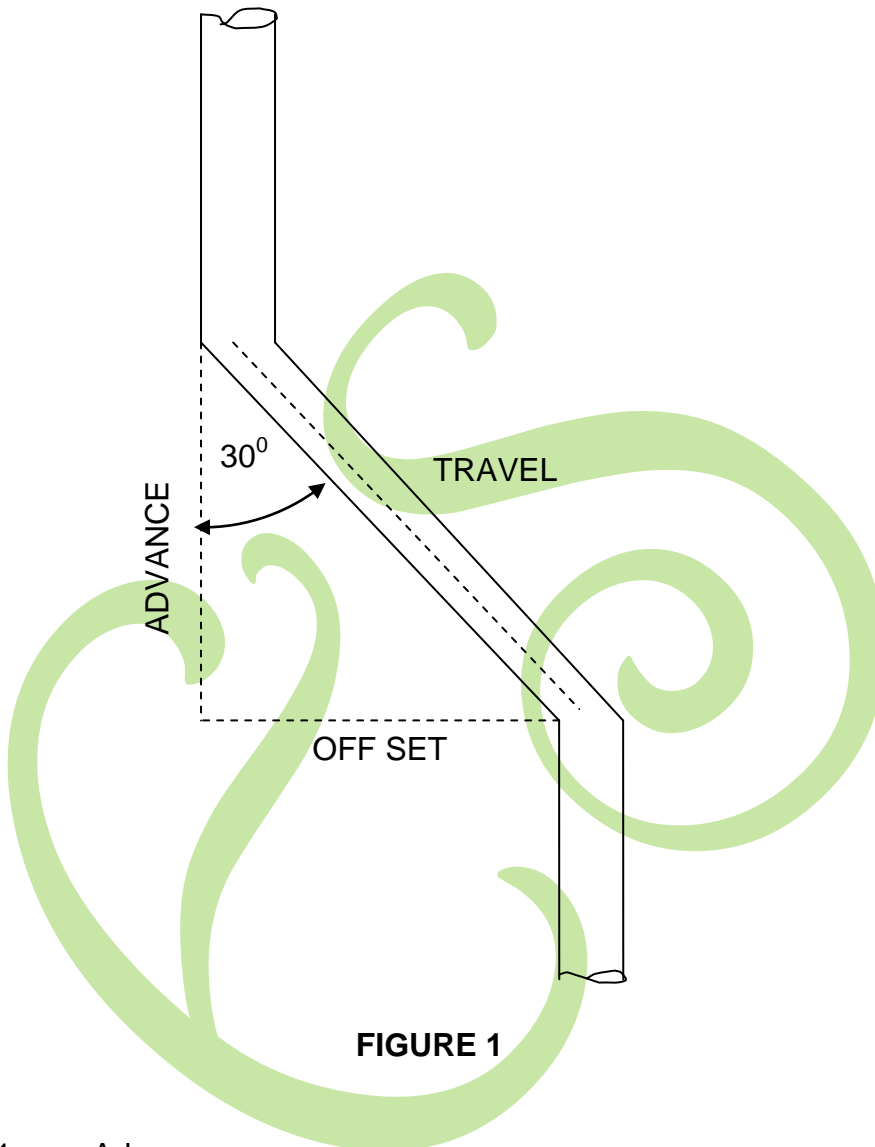
Inner radius
Heel
Flange   (4)
[10]

QUESTION 3: JOINING OF STEEL PROFILES

3.1   Explain why it is important to join steel profiles.   (2)

3.2   What is the main purpose of an assembly jig?   (2)

3.3   Explain the term *permanent joint*.   (2)

3.4   Differentiate between an *assembly jig* and a *holding device*. (2 × 2)   (4)
[10]

QUESTION 4: GENERAL PIPEWORK

4.1   Name ONE use of each of the following:

4.1.1   Pipefitter's square

4.1.2   Pipe contour-maker

4.1.3   Pipe reducer

4.1.4   Flange

(4 × 1)   (4)

4.2   The FIGURE below shows three pipes that are joined together.

30^0

ADVANCE

TRAVEL

OFF SET

FIGURE 1

    4.2.1   Advance

    4.2.2   Offset

                                                                    (2 × 3)   (6)
                                                                                [10]

QUESTION 5: ROOF TRUSS

5.1 Briefly explain the following terms:

    5.1.1 Strut

    5.1.2 Gusset

        (2 × 2)   (4)

5.2 What is the average angle of a rafter's inclination with roof truss data of 4 mm belowrise and a run of 5 mm?   (2)

5.3 Explain how the angle of inclination ofrafters will affect the truss at any given time.
(HINT:Effect of an angle which is too small or too big)   (4)
        [10]

QUESTION 6: TEMPLATE AND PATTERNMAKING

6.1 Briefly explain a *template* and give ONE example.   (3)

6.2 State TWO uses of a template.   (2)

6.3 State what type of material is used to make a template for automotive packaging and give a reason?   (3)

6.4 Explain how templates can be damaged.   (2)
        [10]

QUESTION 7: METALS

7.1 Tabulate the differences between *ferrous metals*and *nonferrous metals* and give ONE example of each.   (2 × 2)   (4)

7.2 Briefly explain each of the following metal properties:

    7.2.1 Malleability

    7.2.2 Plasticity

        (2 × 2)   (4)

7.3 State TWO purposes of case-hardening.   (2)
        [10]

QUESTION 8: GAS WELDING

8.1   NameTWO gases which are used in oxyacetylene cutting.   (2)

8.2   What is the function of each of the following equipment:

      8.2.1   Oxygen hose

      8.2.2   Cylinder valve
                                                          (2 × 1)   (2)

8.3   When lighting up the cutting torch, which gas is opened first and why?   (2)

8.4   What would be the ratio of oxygen to acetylene for a neutral flame?   (2)

8.5   Explain the term*flame-cleaning nozzle*.   (2)
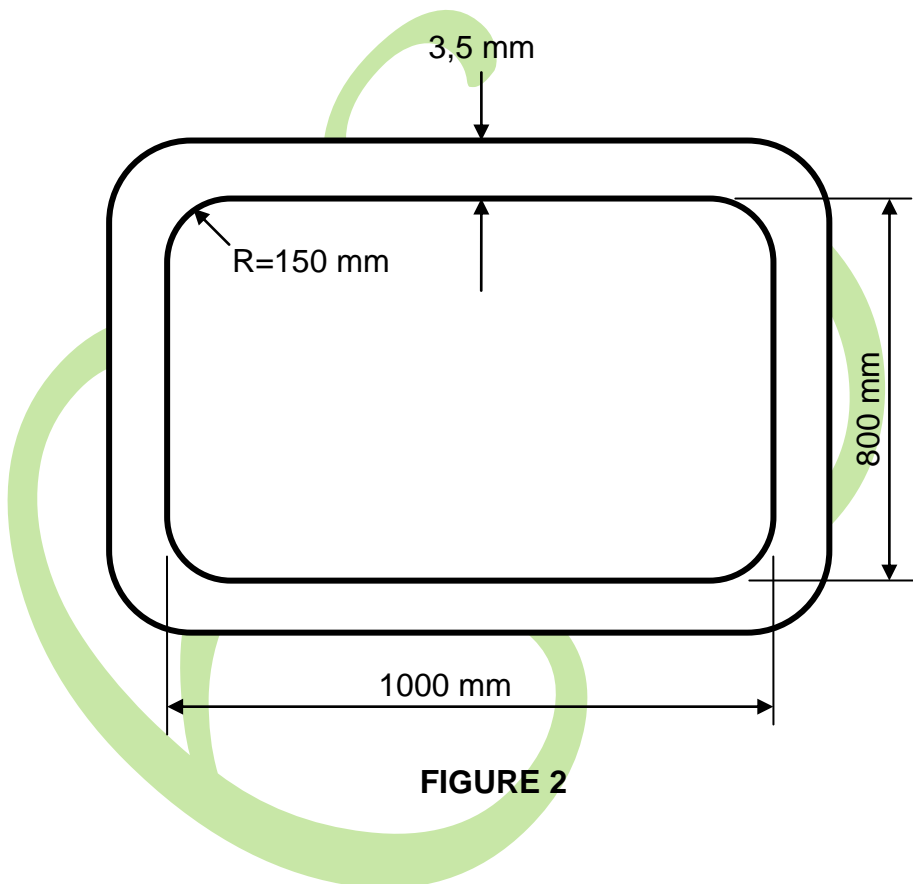   **[10]**

QUESTION 9: ARC WELDING

9.1   Define the following welding terms:

      9.1.1   Reinforcement

      9.1.2   Run
                                                          (2 × 2)   (4)

9.2   Draw a welding symbol for an all-around fillet weld.   (4)

9.3   Explain the function of the flux coating of welding electrode.   (2)
                                                                      [10]

QUESTION 10: CALCULATIONS AND PLANNING

10.1 The FIGURE 2 below shows a flat bar in a rectangular shape with four radius corners.

Carefully study the figure and calculate the total length of the bar.

(HINT: Consider the thickness of the bar for the mean diameter.)

3,5 mm

R=150 mm

800 mm

1000 mm

FIGURE 2

[10]

TOTAL: 100