higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1320(**E**)(A1)T

NATIONAL CERTIFICATE

PLATERS' THEORY N2

(11022182)

1 August 2018 (X-Paper)
09:00–12:00

Drawing instruments and non-programmable calculators may be used.

This question paper consists of 7 pages.

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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.

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QUESTION 1: MACHINES AND SAFETY

1.1 State THREE general safety precautions to be observed when working in a workshop. (3)

1.2 Explain why colour coding is widely used on equipment, machines and in workshops. (2)

1.3 Refer to FIGURE 1 below and answer the questions.

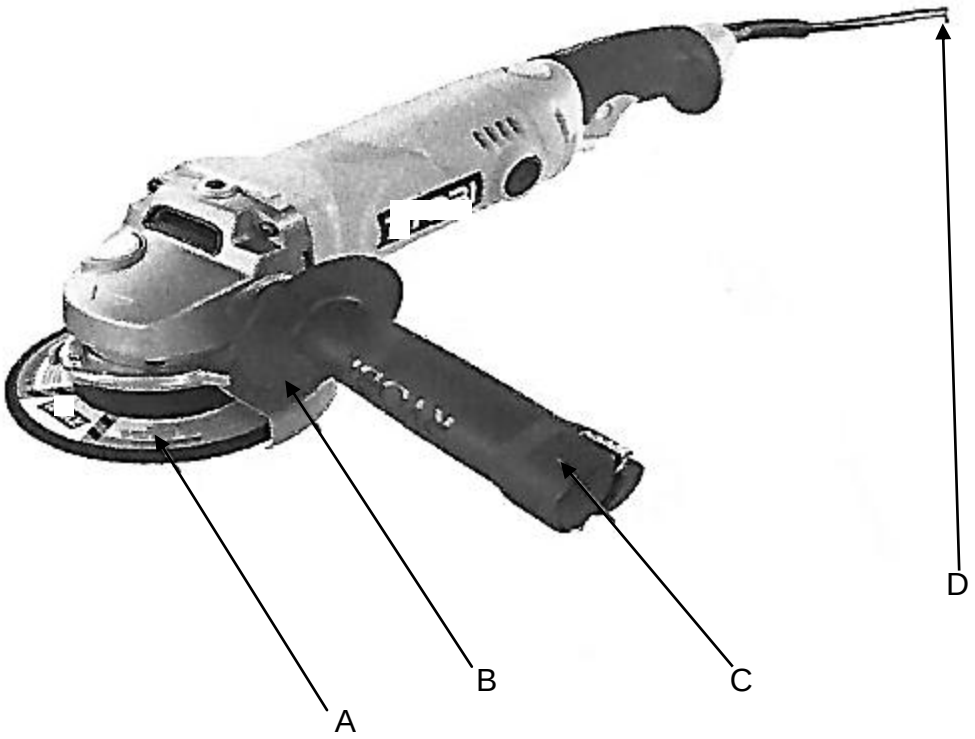

FIGURE 1

1.3.1 Name the above portable electrical equipment. (1)

1.3.2 Name the parts indicated on the sketch by writing only the answer next to the letter (A–D) in the ANSWER BOOK. (4)

[10]

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QUESTION 2: ROLLING AND BENDING

2.1 Explain using standard or reasonable sizes the difference between equal-leg and unequal-leg angle iron. (4)

2.2 Calculate the length of material needed to manufacture a 50 × 50 × 4 mm external angle-iron ring with a heel diameter of 1 500 mm.

HINT: L = π {D + T + (T ÷ 3)} (3)

2.3 Explain the function of the three rollers in a rolling machine. (3)
[10]

QUESTION 3: JOINING OF STEEL PROFILE

3.1 Name FOUR advantages of a well-designed jig that is used in the workshop. (4)

3.2 What is the main function of pipe flanges? (2)

3.3 State whether each of the following joining methods is temporary or permanent:

3.3.1 Riverting

3.3.2 Tack welding

3.3.3 Soldering

3.3.4 Bolting

(4 × 1) (4)
[10]

QUESTION 4: GENERAL PIPEWORK

4.1 Make a neat, simple sketch of each of the following:

4.1.1 T-piece pipe

4.1.2 90-degree elbow pipe

(2 × 2) (4)

4.2 Explain the function of the following:

4.2.1 Contour-maker

4.2.2 Pipe flanges

(2 × 2) (4)

4.3 Make a drawing of a two-hole-top pipe flange. (2)
[10]

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QUESTION 5: ROOF TRUSSES

5.1 Explain the following terms:

5.1.1 Span

5.1.2 Pitch

(2 × 2) (4)

5.2 The mass of the roof truss is 2 150 kg and that of the roofing material is 1 tonne.

Calculate the reaction force on each support to ensure a stable structure. Make a sketch to support your answer. (6)

[10]

QUESTION 6: TEMPLATE AND PATTERNMAKING

6.1 Write down FIVE items that should be displayed on a template. (5)

6.2 Explain why a template is always made of a cheaper material than the material used for the actual product. (2)

6.3 Before a template is made, measurements are taken to draw the pattern using three different drawing scales.

Name these THREE drawing scales. (3)

[10]

QUESTION 7: METALS

7.1 Explain what a ferrous metal is and give an example of a ferrous metal. (2)

7.2 Which metal will be best suited for the following products or designs:

7.2.1 Wiring the building for electricity

7.2.2 Electric gate

7.2.3 Car emblem

(3 × 2) (6)

7.3 Define the term *heat-treatment process*. (2)

[10]

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QUESTION 8: GAS CUTTING

8.1 Oxygen and acetylene are mostly used for cutting and welding metal.

Explain the function of each gas. (2)

8.2 Which equipment is used for the following:

8.2.1 Storage of oxygen and acetylene gases

8.2.2 Lighting a torch

8.2.3 Changing the nozzle

8.2.4 Cleaning nozzle holes

(4 × 1) (4)

8.3 What is the function of a leather apron? (2)

8.4 Name TWO cutting defects. (2)

[10]

QUESTION 9: ARC WELDING

9.1 Define the following terms:

9.1.1 Flux

9.1.2 Parent metal

9.1.3 Shielding gas

9.1.4 Run

(4 × 1) (4)

9.2 Briefly explain the following:

9.2.1 Weld sequence

9.2.2 Electrode

(2 × 2) (4)

9.3 Name TWO commonly used welding methods. (2)

[10]

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QUESTION 10: CALCULATIONS AND PLANNING

Calculate the mass of metal contained in 20 finished trays, if one tray has the following data:

Depth = 100 mm
Length = 900 mm
Width = 350 mm
Thickness = 4 mm
Mass of one plate is 7,85 kg/square-metre/mm thick **[10]**

TOTAL: 100

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