



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

**T1270(E)(A4)T
APRIL EXAMINATION**

NATIONAL CERTIFICATE

PLATERS' THEORY N2

(11022182)

**4 April 2016 (X-Paper)
9:00–12:00**

Drawing instruments and nonprogrammable calculators may be used.

This question paper consists of 6 pages, 3 diagram sheets and 1 addendum.

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
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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

- 1.1 FIGURE 1, DIAGRAM SHEET A (attached), shows a punch, shear and cropping machine. Label the components indicated with the letters (A–E) and write the answer next to each letter (A–E) in the ANSWER BOOK. (5)
- 1.2 State THREE safety precautions to be observed when working with the reciprocating power saw. (2)
- 1.3 Briefly describe the use of the pedestal grinding machine. (3)
- [10]

QUESTION 2: ROLLING AND BENDING

- 2.1 Briefly describe, with the aid of freehand drawings, how pyramid bending rolls bend a plate. (5)
- 2.2 FIGURE 2, DIAGRAM SHEET A (attached), shows a top view of an angle-iron frame.
- Make a detailed drawing of the length of the angle iron before it is bent to the frame. Indicate the allowances for the material thickness to be considered. (5)
- [10]

QUESTION 3: JOINING OF ROLLED STEEL SECTIONS

- 3.1 State THREE advantages with which a well-designed welding jig should comply. (3)
- 3.2 Illustrate, by means of a neat, freehand drawing, a method to join an angle iron to an H-profile. (3)
- 3.3 FIGURE 3, DIAGRAM SHEET B (attached), shows two plates that have to be welded together.
- Make a freehand drawing of a device made of scrap metal available in the workshop to bring the two plates closer together for welding. (4)
- [10]

QUESTION 4: GENERAL PIPEWORK

4.1 FIGURE 4, DIAGRAM SHEET B (attached), shows an outside view of a centre finder.

Name the parts indicated by the letters. Write only the answer next to the letter (A–D) in the ANSWER BOOK.

(4)

4.2 FIGURE 5, DIAGRAM SHEET C (attached), shows a pipe reducer.

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

(6)
[10]

QUESTION 5: STEEL STRUCTURES

FIGURE 6, DIAGRAM SHEET C (attached), shows a part of a steel roof truss. Label the parts indicated by the letters (A–F), by writing only the answer next to the letter (A–F) in the ANSWER BOOK.

[6]

QUESTION 6: TEMPLATES

6.1 Make a freehand drawing of a steel bushed template.

6.2 Give TWO reasons for the use of templates.

6.3 State TWO advantages of templates.

(3 x 2)

[6]

QUESTION 7: METALS

7.1 What is a *non-ferrous metal*. (1)

7.2 A number of options are given below. Write down the most correct answer next to the question number (7.2) in the ANSWER BOOK.

The process used to reduce the brittleness of a fully hardened center punch is called ...

- A annealing.
- B tempering.
- C quenching.
- D normalising. (1)

7.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (7.3.1–7.3.3) in the ANSWER BOOK.

7.3.1 Vanadium refines the grain structure and increases the bending resistance, wear resistance and fatigue resistance of steel.

7.3.2 Silicon increases the resistance to fatigue and the toughness of steel.

7.3.3 Chrome improves the strength, increases the temperature required for effective hardening and the wear resistance of steel.

(3 × 2) (6)
[8]

QUESTION 8: GAS WELDING AND CUTTING

8.1 Name FOUR factors that influence the quality of oxyacetylene welding. (4)

8.2 State why flame cleaning nozzles are used in the industry. (3)

8.3 Name THREE metals that can be cut by a plasma cutter. (3)
[10]

QUESTION 9: ARC WELDING

- 9.1 Make a drawing of the following and then describe each of these welding terms next to the question number (9.1.1–9.1.3):
- 9.1.1 Deposited metal
 - 9.1.2 Electrode
 - 9.1.3 Penetration
- (3 × 3) (9)
- 9.2 Make a drawing of the following and then give a description of each of these welding terms next to the question number (9.2.1–9.2.3):
- 9.2.1 Weld zone
 - 9.2.2 Parent metal
 - 9.2.3 Reinforcement
- (3 × 2) (6)
[15]

QUESTION 10: CALCULATION AND PLANNING

- 10.1 Calculate the mass of metal for the manufacturing of 120 finished trays – 800 mm long, 380 mm wide and 100 mm deep.
- The trays are made of 5 mm mild steel plate with a mass of 7,85 kg/m² per mm thickness.
- (10)
- 10.2 TABLE 1 in the ADDENDUM (attached), shows a weight table.
- Determine the mass of the following plates from the given table:
- 10.2.1 150 × 16 × 4 000 mm long (2)
 - 10.2.2 400 × 25 × 450 mm long (3)
- [15]**
- TOTAL: 100**

DIAGRAM SHEET A

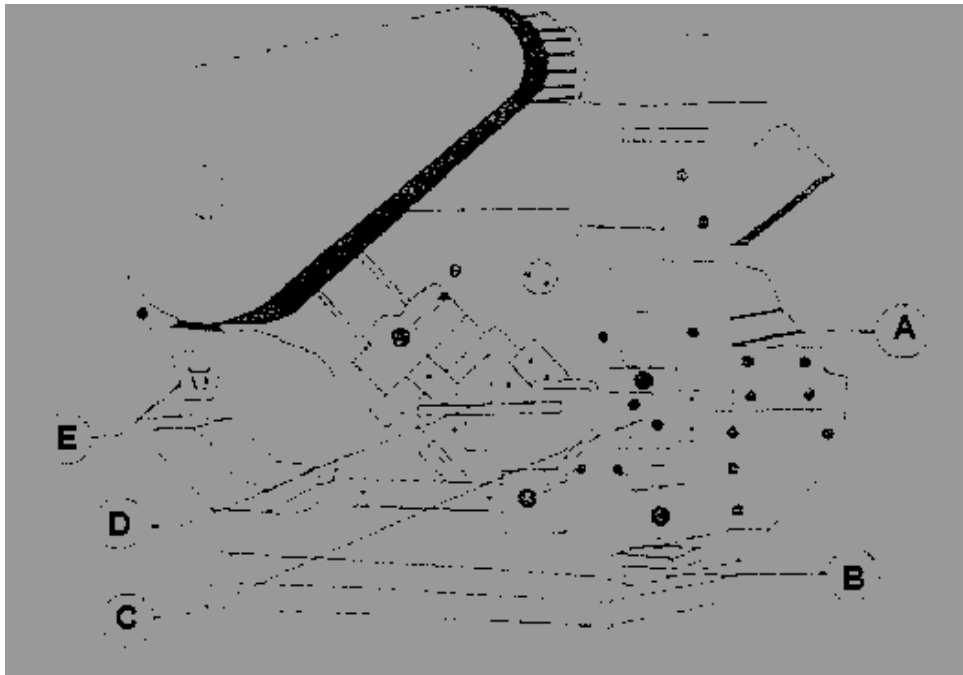


FIGURE 1

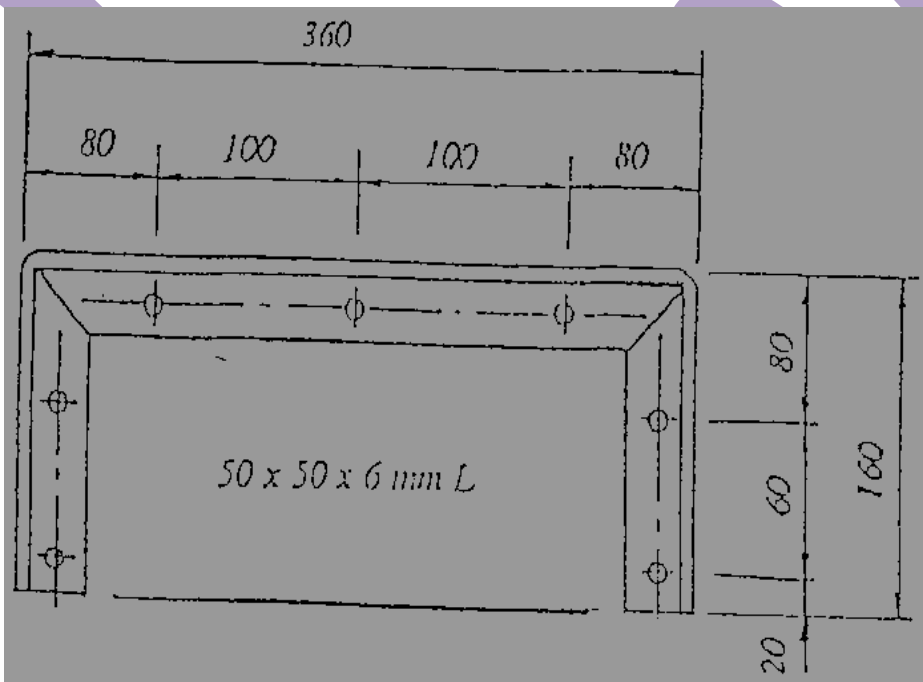


FIGURE 2

DIAGRAM SHEET B

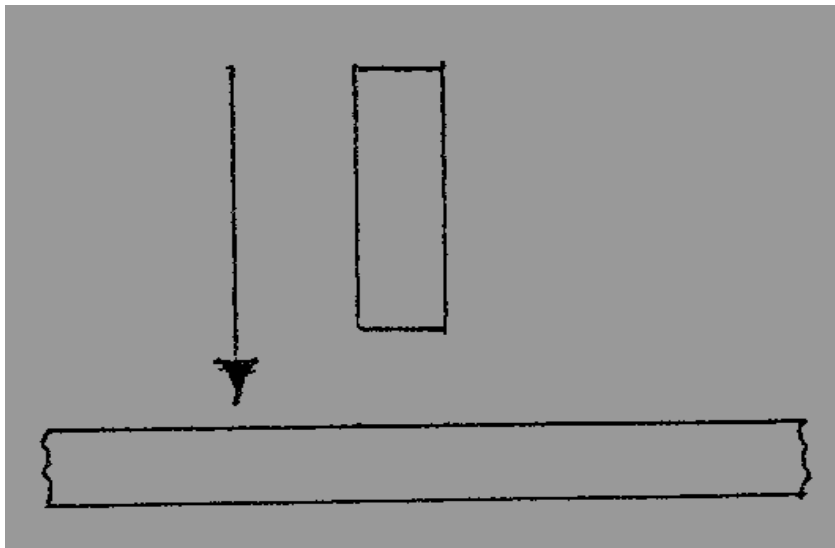


FIGURE 3

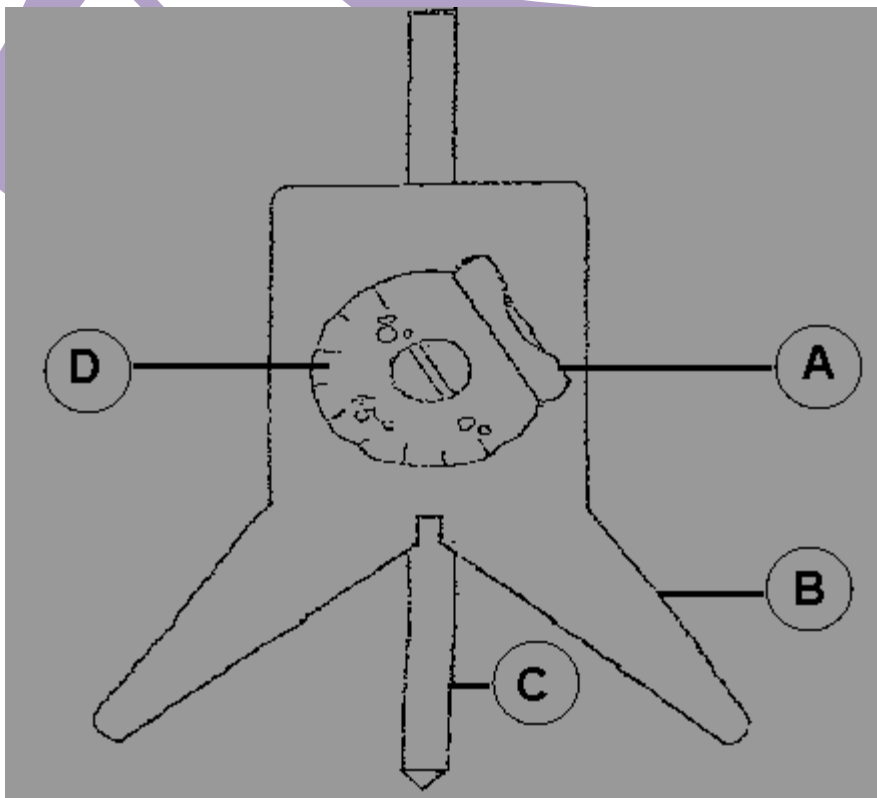


FIGURE 4

DIAGRAM SHEET C

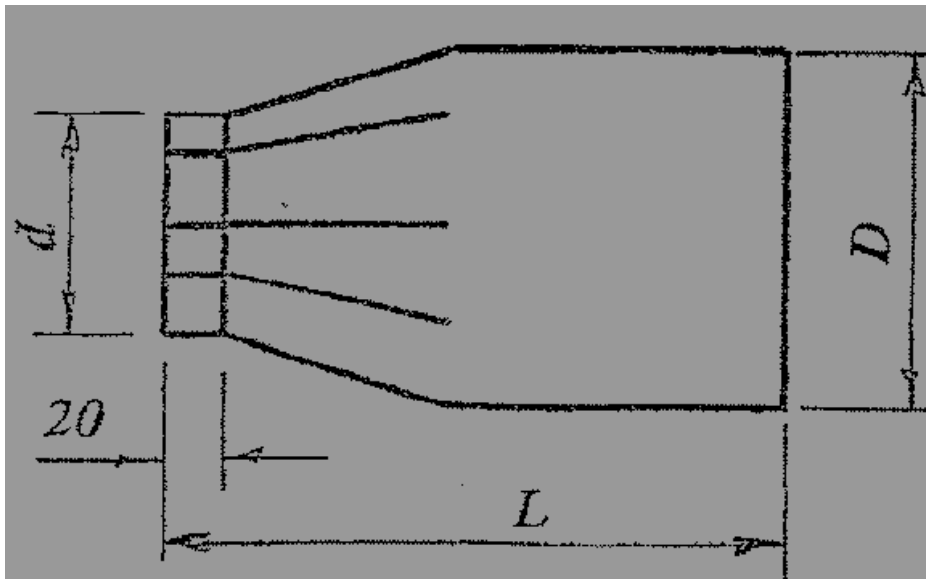


FIGURE 5

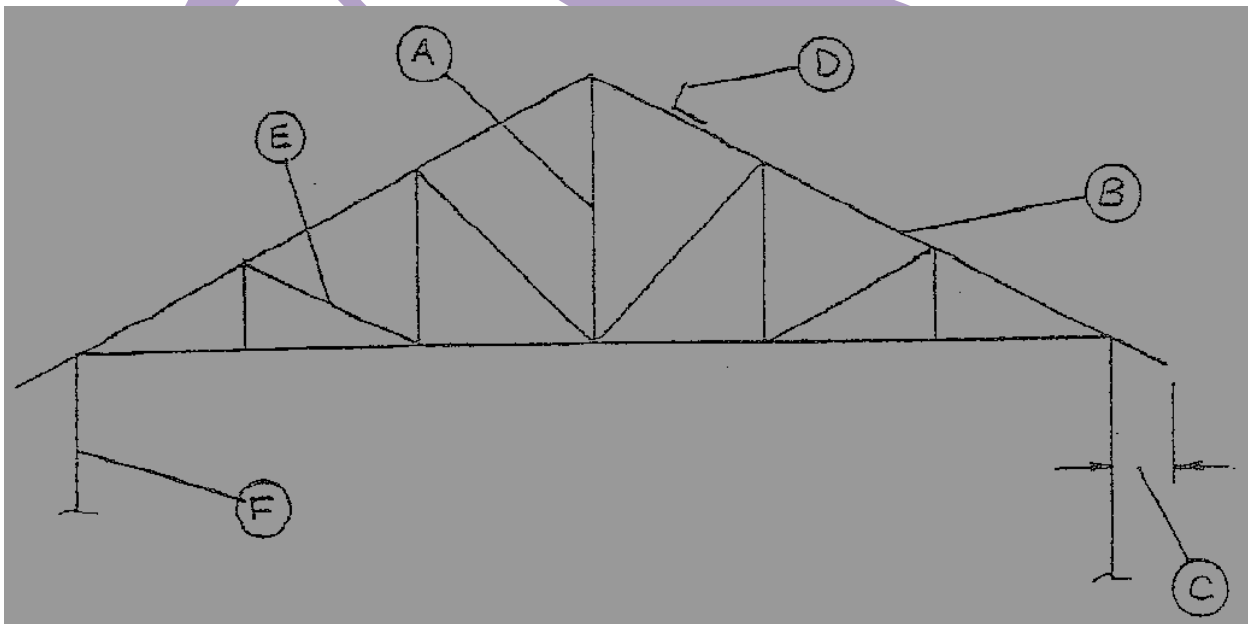


FIGURE 6

ADDENDUM

Thickness mm	Mass in kg/m for widths in mm										
	100	110	130	150	180	200	250	300	350	400	450
6	4.71	5.18									
8	6.28	6.91	8.16	9.42							
10	7.85	8.64	10.24	11.8	14.1	15.7					
12	9.42	10.4	12.2	14.1	17.0	18.8					
14	11.0	12.1	14.3	16.5	19.8	22.0					
16	12.6	13.8	16.3	18.8	22.6	25.1	31.4	37.7			
18	14.1	15.4	18.4	21.2	25.4	28.3	35.3	42.4	49.4	56.5	63.5
20	15.7	17.3	20.4	23.6	28.3	31.4	39.2	47.1	54.9	62.8	70.6
25	19.6	21.6	25.5	29.4	35.3	39.2	49.1	58.9	68.6	78.5	88.2
30	23.6	25.9	30.6	35.3	42.4	47.1	58.9	70.6	82.4	94.2	106.0
35	27.5	30.2	35.7	41.2	49.5	55.0	68.7	82.4	96.1	110.0	124.0

TABLE 1