higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

PLATERS' THEORY N2

(11022182)

20 November 2020 (X-paper)
09:00–12:00

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. Write neatly and legibly.

QUESTION 1: MACHINES

1.1 Briefly describe the working principle of the cropper on a punching and shearing machine. (3)

1.2 Name THREE uses for the pedestal grinding machine. (3)

1.3 Name FOUR safety precautions to observe when working with a punching machine. (4)
[10]

QUESTION 2: ROLLING AND BENDING

2.1 The heel diameter of 45 mm × 45 mm× 6 mm external angle-iron ring is 24,5 cm.

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

$L = [D - T - (T \div 3)] \times 3{,}142$

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

2.2 Briefly explain how an external angle-iron ring is formed using the roller shown in FIGURE 1.

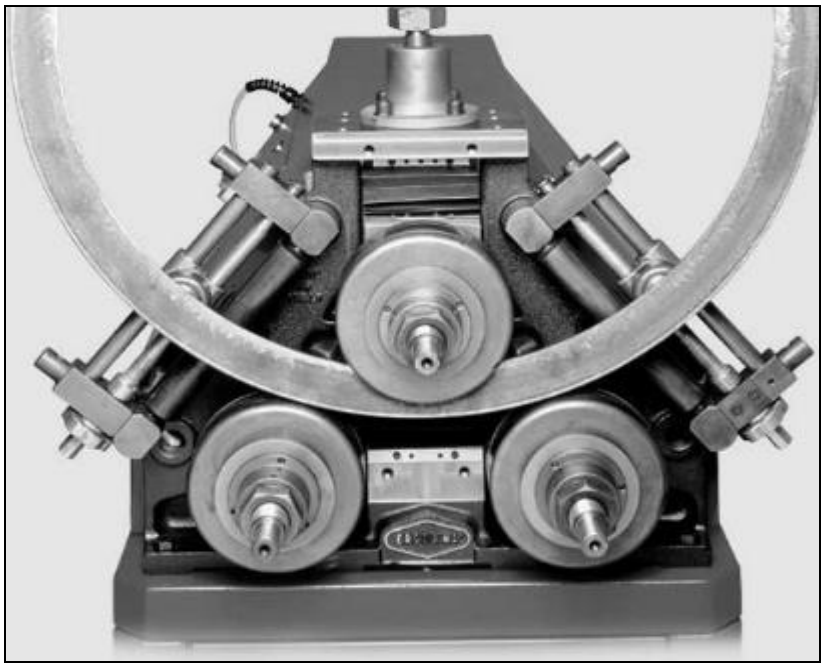

FIGURE 1

(5)
[10]

QUESTION 3: JOINING OF STEEL PROFILES

3.1 What is the purpose of an assembly jig? (4)

3.2 Name FOUR types of steel profiles used in construction work. (4)

3.3 State TWO requirements of a well-designed jig. (2)
[10]

QUESTION 4: GENERAL PIPE WORK

4.1 Show each of the following by means of freehand drawings:

4.1.1 Two-hole top referring to pipe flanges

4.1.2 How to measure the centre-to-face (C-F) of a pipe elbow of 90°.
(2 × 2) (4)

4.2 FIGURE 2 below shows the outside view of a pipe contour maker.

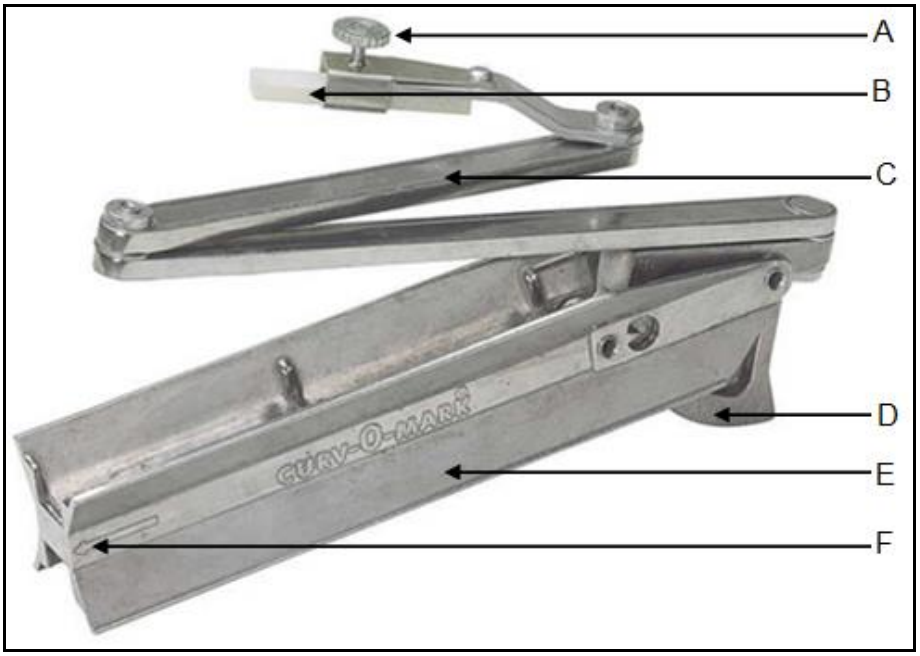

FIGURE 2

Name the parts A–F by writing only the answer next to the letter (A–F) in the ANSWER BOOK. (6)
[10]

QUESTION 5: STEEL STRUCTURES

Identify the parts of the steel roof truss shown in FIGURE 3 below by writing only the answer next to the letter (A–F) in the ANSWER BOOK.

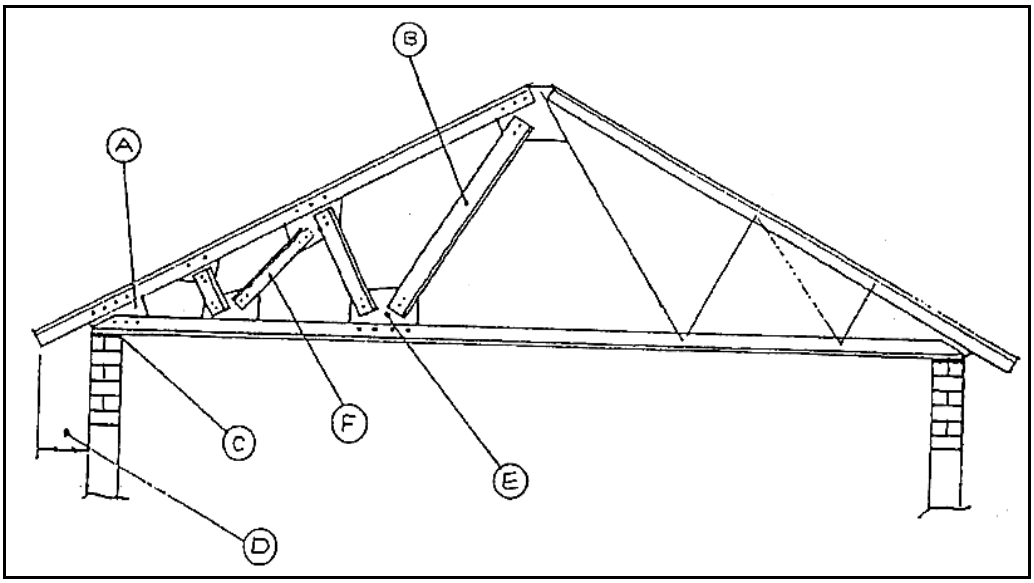

FIGURE 3 **[6]**

QUESTION 6: TEMPLATES

State the use of templates made from each of the following materials:

6.1 Hardboard

6.2 Sheet metal

6.3 Steel plate

(3 × 2) **[6]**

QUESTION 7: METALS

7.1 What is the function of tempering applied to the heat treatment process? (2)

7.2 State THREE adverse effects each of the following elements has in changing the properties of steel when they are alloyed:

7.2.1 Manganese

7.2.2 Vanadium

(2 × 3) (6)
[8]

QUESTION 8: GAS WELDING AND CUTTING

Explain each of the following terms as applicable to oxy-acetylene gas welding:

8.1 Oxy-acetylene

8.2 Backfire

8.3 Oxidizing flame

8.4 Carburising flame

8.5 Sustained backfire

(5 × 2) **[10]**

QUESTION 9: ARC WELDING

9.1 Make a large, freehand drawing of a welding symbol in which each of the following is shown:

9.1.1 Arrow

9.1.2 Single V-butt weld

9.1.3 Reference line

9.1.4 Tail

9.1.5 Machine finish

(5 × 1) (5)

9.2 Name FIVE causes of undercutting. (5)

[10]

QUESTION 10: CALCULATION AND PLANING

Copy the TABLE below in your ANSWER BOOK. List all the components of the welded frame as shown in FIGURE 4 on the material list. Determine the total mass of the frame.

MARK	QUANTITY	MATERIAL	LENGTH	Kg/m	TOTAL MASS
A		50 × 50 × 6L	2,88 m	4,47	
B		50 × 50 × 6L	2,52 m	4,47	
C		65 × 65 × 8L	2,40 m	7,72	
D		65 × 65 × 8L	8,40 m	7,72	
E		50 × 100⊏	1,50 m	10,6	
F		50 × 100⊏	1,59 m	10,6	
				TOTAL	

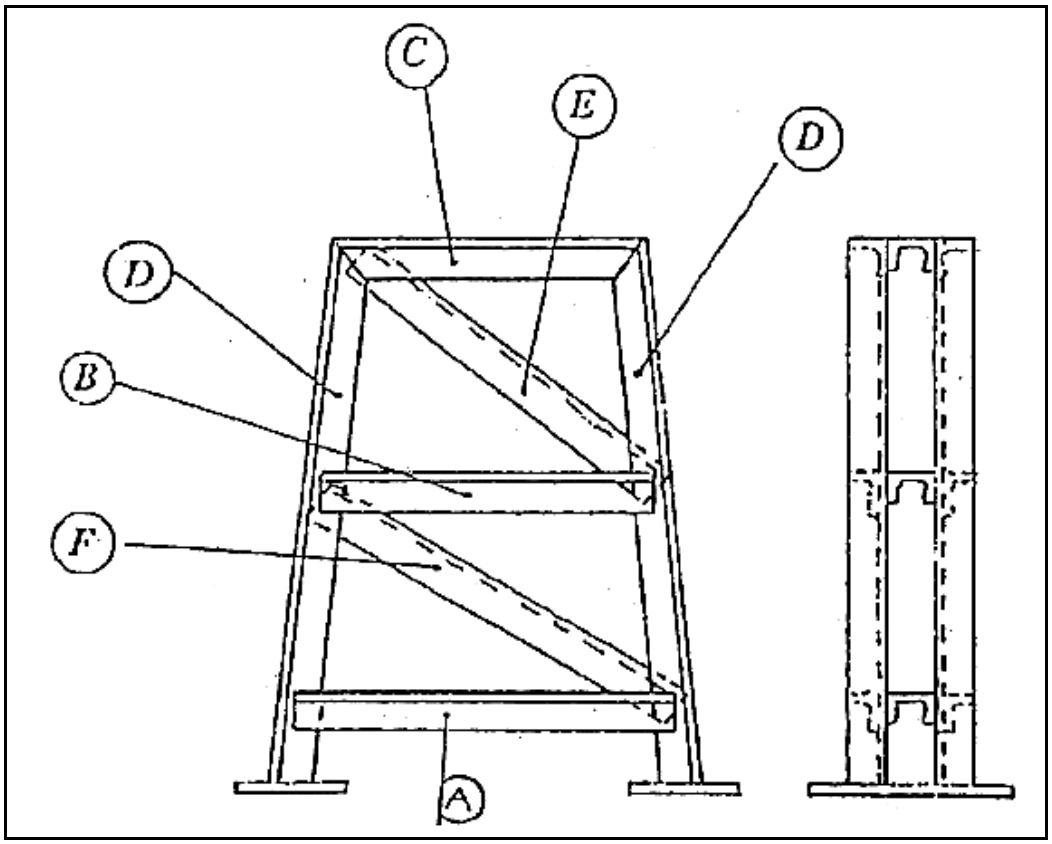

FIGURE 4

[20]

TOTAL: 100