higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

PLATERS' THEORY N2

1 AUGUST 2018

This marking guideline consists of 7 pages.

QUESTION 1: MACHINES AND SAFETY

1.1
- Wear safety goggles for eye protection.
- Do not use a machine without guards.
- Use clamping devices to hold a workpiece in place before machining.
- Do not leave a machine running unattended.
- Only qualified artisans are allowed to work with machines. (Any 3 × 1) (3)

1.2 It is used for indicating and warning against any potential hazards in the workshop. (2)

1.3 1.3.1 Angle grinder (1)

1.3.2 A – Grinding disc
B – Guard
C – Handle
D – Electric cable (4)

[10]

QUESTION 2: ROLLING AND BENDING

2.1
- Equal-leg is the steel profile which is L-shaped with equal flanges, e.g. 50 × 50 × 6 mm.
- Unequal leg is the steel profile which is L-shaped with unequal flanges, e.g. 50 × 60 × 6 mm. (2 × 2) (4)

2.2 $L = \pi \{D + T + (T \div 3)\}$

$= 3{,}142 [1\,500 + 4 + (6 \div 3)]$

$= 3{,}142 [1\,500 + 4 + 2]$

$= 3{,}142 [1\,506]$

$= 4731{,}852$ mm (3)

2.3 The top roller rotates in the opposite direction as the bottom rollers, pushing the metal plate between the rollers for the rolling action.
The fixed two in-line bottom rollers pull the metal plate between the rollers for perfect rolling. (Any relevant answer) (Any 3 x 1) (3)

[10]

QUESTION 3: JOINING OF STEEL PROFILE

3.1
- Assembled items are identical.
- Assembly time is reduced.
- Only one worker can do the work.
- It saves unnecessary measuring.
- It enables an untrained person to do the work alone.
- Jigs can be stored for a long period of time and used again.
- It reduces distortion.
- It reduces the cost of production. (Any 4 × 1) (4)

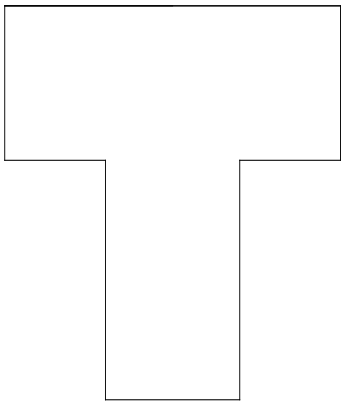
3.2 Pipe flanges are attached at the end of the pipe to allow the joining of another pipe of the same size by bolting. (2)

3.3
3.3.1 Permanent
3.3.2 Temporary
3.3.3 Permanent
3.3.4 Temporary

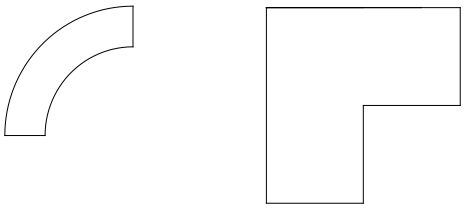
(4 × 1) (4)
[10]

QUESTION 4: GENERAL PIPEWORK

4.1 4.1.1



"T"- PIECE



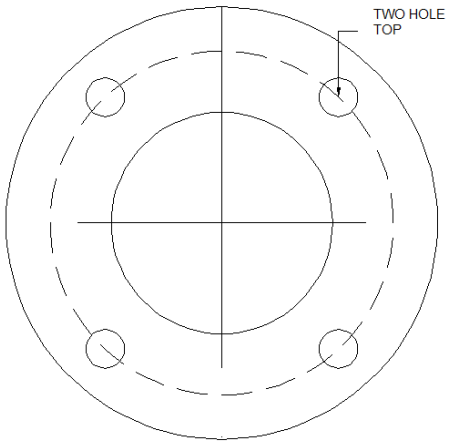
90 DEGREE BEND

(2 × 2) (4)

4.2 4.2.1 A contour-maker creates and measures the shape of a hole.

4.2.2 Pipe flanges are used to join two pipes of the same size by bolting.
(2 × 2) (4)

4.3



TWO-HOLE-TOP PIPE FLANGE (2)
[10]

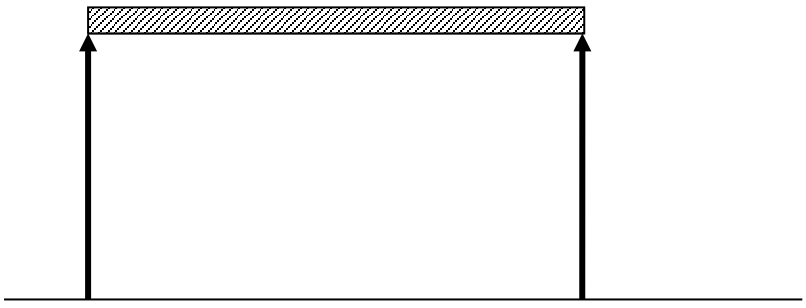
QUESTION 5: ROOF TRUSSES

5.1 5.1.1 Span is the distance from one support to another along the tie beam.

5.1.2 Pitch is the ratio of rise to run.

(2 × 2) (4)

5.2 UDL = (2 150 + 1 000) × 9,81
= 30,902 kN
R1 = 30,902/2
= 15,451 kN (4)



Sketch Counts 2 marks

QUESTION 6: TEMPLATE AND PATTERNMAKING

6.1
- Drawing number
- Job number
- Item number
- Size of the hole
- Number of items
- TSU/OSU
- Material size (Any 5 × 1) (5)

6.2 The template is only used as a visualisation of what is needed and therefore it does not require durable material. (Any relevant answer) (2)

6.3
- Full scale/Actual Scale
- Downscale/Reduced Scale
- Upscale/enlargement (3)

[10]

QUESTION 7: METALS

7.1 These metals mainly contain iron e.g. mild steel, nickel, etc. (2)

7.2
7.2.1 Nonferrous metal or copper
7.2.2 Ferrous or tungsten alloy
7.2.3 Chromium alloys or chrome
(3 × 2) (6)

7.3 A heat-treatment process is the process of heating metal to a certain temperature and to cool it down using different cooling mediums for particular purposes. (2)

[10]

QUESTION 8: GAS CUTTING

8.1
- Acetylene melts most metals
- Oxygen melts most metals (2)

8.2
8.2.1 Oxygen and acetylene cylinder
8.2.2 Spark lighter
8.2.3 Set of spanners
8.2.4 Spindles or nozzle cleaner
(4 × 1) (4)

8.3 It is used to protect the body from welding sparks. (2)

8.4
- Wavy cut edge
- Uneven dragline
- Rough-cut surface
- Undercutting
- Excessive slag

(Any 2 × 1) (2)
[10]

QUESTION 9: ARC WELDING

9.1 9.1.1 Flux is an electrode coating which prevents external substances from contaminating a weld.

9.1.2 Parent metal is the metal to be welded or joined.

9.1.3 Shielding gas is the gas used to prevent other harmful gases not to contaminate.

9.1.4 Run is the metal melted during one passage of electrode.

(4 × 1) (4)

9.2 9.2.1 The order and direction in which welds, joints or runs are to be welded. (2)

9.2.2 A rod or wire (usually covered) for providing weld metal by fusion in the electric arc. (2)

9.3
- Forward
- Backwards
- Overhead

(Any relevant answer) (Any 2 × 1) (2)
[10]

QUESTION 10: CALCULATIONS PLANNING

A1 = 900 × 350 = 315 000 square millimetres (1)
A2 = 900 × 100 × 2 = 180 000 square millimetres (1)
A3 = 100 × 350 × 2 = 70 000 square millimetres (1)

TOTAL AREA = A1 + A2 + A3 = 565 000 square millimetres (2)
Mass = 7,85 × 0,565 × 4 × 20 (3)
= 354,82 kg (2)
[10]

TOTAL: 100