higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

AUGUST EXAMINATION

PLATERS' THEORY N2

22 JULY 2014

This marking guideline consists of 8 pages.

QUESTION 1: MACHINES

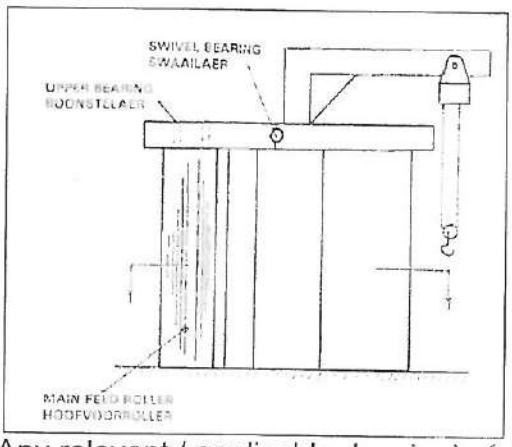
1.1 Keep your hands clear of the moving rolls.
Beware of catching your fingers between the moving rollers and the work.
Avoid wearing cloves near the moving rollers.
Ensure the work is held firmly when rolling the edge of the plate.
(Any applicable three) (3x1) (3)

1.2 The bottom two rolls are usually driven and work on fixed centres, while the top roller of larger diameter is adjustable up and down to suit the metal thickness and the radius of curvature to be rolled. ✓
In the bending action the metal is fed forward onto the rear roll and the top roll lowered before bending can take place. ✓
The plate is rolled forward and backward until the required cylnder is obtained. ✓
(3)

1.3 A = Swing beam ✓
B = Bending beam✓
C = Blade adjustable handle✓
D = Segmental top blade✓
(4)
[10]

QUESTION 2

2.1 The plate to be rolled is entered vertically into the bending rolls, where the reciprocating beam is brought forward to exert maximum force on the plate until the required radius is formed. ✓
After rolling of the plate to the required diameter, the upper bearing can be swung up for the removal of the cylinder. ✓
(2)

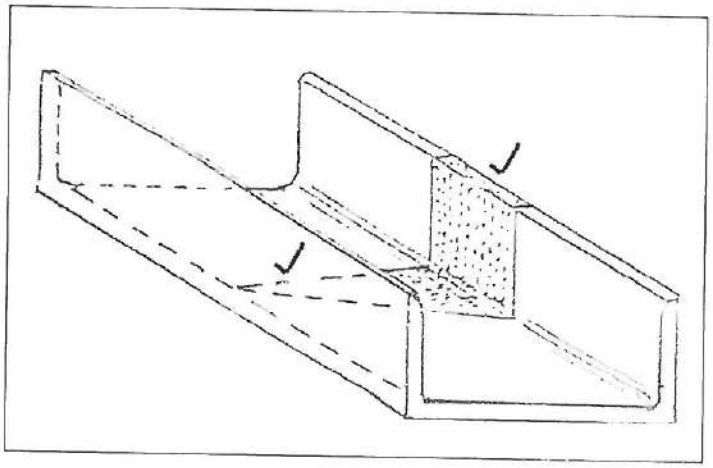


(Any relevant / applicable drawing) ✓✓ (2)

2.2 A = 290/2 - 6 = 139 mm ✓
B = 380 - 2 x 6 = 368 mm ✓
C = 290 - 2 x 6 = 278 mm ✓

Total length: = 2 x A + 2 x B + C
= 2 x 139 + 2 x 368 + 278
= 1 292 mm→ ✓ (4)

2.3

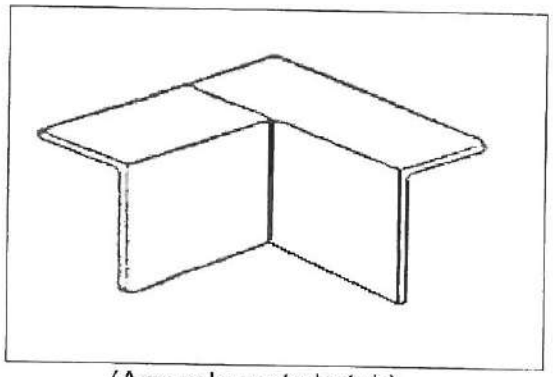


(2)
[10]

QUESTION 3

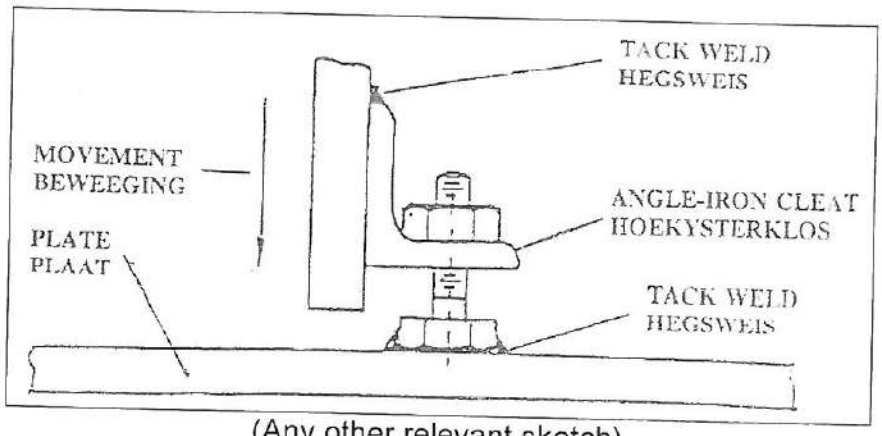
3.1 To hold parts in position ✓ so that a number of identical items ✓ can be tack welded and easily removed ✓ before final welding is done. (3)

3.2



(Any relevant sketch)
(Correct profile) ✓
(Correct joint) ✓ (2)

3.3



(Any other relevant sketch) (2)

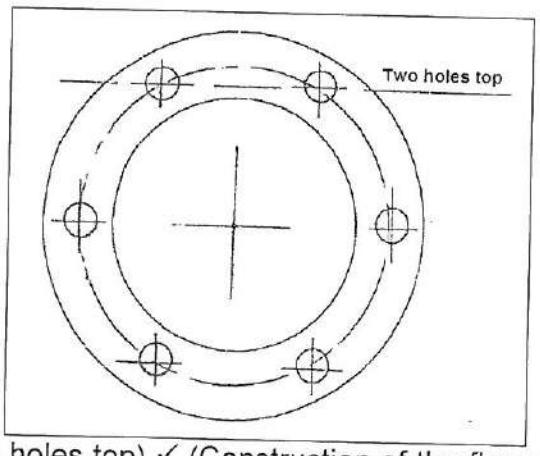
Tack weld the bolthead onto the base plate and slide a holed angle-iron cleat over the bolt. ✓
Tack weld the cleat onto the vertical plate. ✓
By fastening the nut, the two plates will be drawn together. ✓ (3)
[10]

QUESTION 4

4.1
A = Centre line index ✓
B = Channel frame ✓
C = Calibrated protractor ✓
D = Chalk ✓
E = Three joint marking arm ✓
F = Protractor locking screw ✓

(6 x 1) (6)

4.2



(Two holes top) ✓ (Construction of the flange) ✓ (2)
[8]

QUESTION 5

5.1 5.1.1

$Rise^2 = Rafter^2 - (Span/2)^2$
$= 8{,}944^2 - (16/2)^2$
$= 79{,}995 - 64$
$= \underline{15{,}995 \rightarrow}$ ✓
$Rise = \sqrt{15{,}995}$
$= \underline{4m \rightarrow}$ ✓

OR

$Rise^2 = Rafter^2 - (Span/2)^2$
$= 8944^2 - (16/2)^2$
$= 79995136 - 64$
$= \underline{79995072 \rightarrow}$ ✓
$Rise = \sqrt{79995072}$
$= \underline{8943{,}996m \rightarrow}$ ✓

(Any one of above acceptable)

(2)

5.1.2

Pitch = Rise / Span
= 4 / 16 ✓
= 1 / 4
= $\underline{1 : 4 \rightarrow}$ ✓

OR

Pitch = Rise / Span
= 8943,996 / 16 ✓
= 559 / 1
= $\underline{559 : 1 \rightarrow}$ ✓

(Any one of above acceptable)

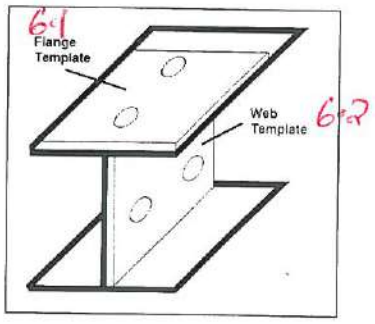
(2)

5.2 A = shoe plate / Gusset ✓
B = Rafter ✓

(2)
[6]

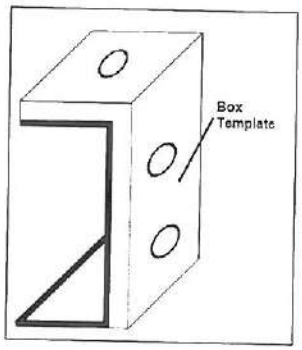
QUESTION 6

6.1
&
6.2



(2)
(2)

6.3



(3 x 2) (2)
[6]

QUESTION 7

7.1 A metal which does NOT contain iron as one of the main constituents. ✓ (1)

7.2 Tempering ✓ (1)

7.3 7.3.1 Chrome ✓✓
7.3.2 Chrome ✓✓
7.3.3 Vanadium ✓✓

(3 x 2) (6)
[8]

QUESTION 8

8.1 Gas pressure ✓
Flame setting ✓
Nozzle type ✓
Nozzle cleanliness ✓ (4)

8.2 Flame cleaning nozzles are used to spread the heating flame ✓so that mill scale, oxide, paint and grease can be removed ✓ from the surface of a work piece. ✓ (3)

8.3 There is excessive melting of top edge. ✓
Undercut at top of cut face. ✓ (2)

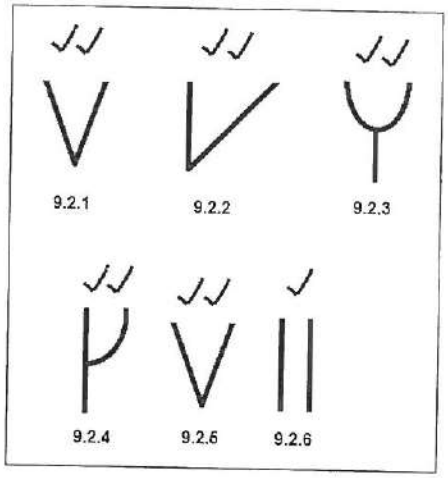
8.4 The flame cutting nozzle mixes the fuel gas and oxygen for the purpose of pre-heating the metal to be cut. ✓ A central port allows a jet of high pressure oxygen ✓ to pass through the nozzle to enable the heated metal to be cut. ✓ (3)
[12]

QUESTION 9

9.1 9.1.1 Excessive welding currents.
Electrode held at incorrect angle.
Excessive weaving.
Arc length too long.
If the speed is too slow
(Any two) (2 x 1) (2)

9.1.2 Insufficient heat input i.e. too low amperage.
Welding speed too fast.
Incorrect polarity when using DC current.
Incorrect joint design i.e. inaccessible preparation.
(Any two) (2 x 1) (2)

9.2



(11)
[15]

QUESTION 10

10.1 Area of plate: = 0,5 x π x S x (D + d)
= 0,5 x π x 0,5 x (0,6 + 0,3) ✓
= 0,707 m²→ ✓

Mass of plate: = 7,85 x 5 x 0,707✓
= 27,75 kg ✓✓

(5)

10.2

MARK	QUANT	MAT	LENGTH	kg/m	MASS
A	2	70 x 70 x 6L	1,732 x 2 = 3,463 ✓	6,38	22,094✓
B	1	70 x 70 x 6L	3,0 x 1 = 3,0	6,38	19,14✓
C	1	50 x 50 x 6L	0,83 x 1 = 0,83	4,47	3,71✓
D	4	60 x 60 x 6L	0,1 x 4 = 0,4 ✓	5,42	2,17✓
E	2	50 x 100L	0,13 x 2 = 0,26 ✓	11,0	2,86✓
				TOTAL:	49,97 kg✓✓

(10)
[15]

TOTAL: 100

AMENDED

A	2	70X70X6L	1,372x2 = 2,744	6,38	17,50672
B	1	70X70X6L	3,0x1 = 3,0	6,38	19,14
C	1	50X50X6L	0,83x1 = 0,83	4,47	3,7101
D	4	60X60X6L	0,1x4 = 0,4	5,42	2,168
E	2	50X100L	0,13x2 = 0,26	11,0	2,86
			TOTAL :		45,384kg

09/08/2014