

GAUTENG DEPARTMENT OF EDUCATION

SENIOR CERTIFICATE EXAMINATION

**POSSIBLE ANSWERS FOR : METALWORK SG
(Second Paper)**

QUESTION 1

- | | | | |
|------|---|------|---|
| 1.1 | D | 1.11 | D |
| 1.2 | A | 1.12 | B |
| 1.3 | D | 1.13 | D |
| 1.4 | D | 1.14 | C |
| 1.5 | C | 1.15 | C |
| 1.6 | A | 1.16 | B |
| 1.7 | B | 1.17 | D |
| 1.8 | D | 1.18 | A |
| 1.9 | C | 1.19 | D |
| 1.10 | B | 1.20 | C |

[20]

QUESTION 2

- 2.1.1 False
- 2.1.2 True
- 2.1.3 False
- 2.1.4 False
- 2.1.5 True
- 2.1.6 False
- 2.1.7 True
- 2.1.8 False
- 2.1.9 False
- 2.1.10 False

(10)

- 2.2.1 The electrode will stick to the work, ineffective arcing and penetration
- 2.2.2 Difficulty will be experienced in drilling, drill wanders / slips on the work
- 2.2.3 Tool can be pulled into machine, dangerous
- 2.2.4 Spanners can break easily.
- 2.2.5 Chuck will not be able to secure workpiece, workpiece will not spin properly
- 2.2.6 Flame will go out with a snapping sound.
- 2.2.7 The alloy will form small round balls without attaching to the metal; the filler metal will not adhere to the parent metal.
- 2.2.8 Screeching sound, smoke, poor finishing, excessive friction.
- 2.2.9 Loose joint, weak joint, shank of rivet may swell between the plates.
- 2.2.10 Electrode will stick to work; difficulty in establishing an arc.

**(10)
[20]**

QUESTION 3

- 3.1 $DXS = dxs$
 $125 \times 1000 = 50xs$
 $\frac{125000}{50} = S$
 $2500 = \text{highest speed}$
- $DXS = dxs$
 $50 \times 1000 = 125xs$
 $\frac{50000}{125} = S$
 $400 = \text{lowest speed}$
- (6)
- 3.2 A – driven pulley (1)
 B – driver pulley (1)
- 3.3.1 Remove pulley cover (1)
 3.3.2 Release V-belt tension (1)
 3.3.3 Change V-belt tension to required speed (1)
 3.3.4 Tension belt and replace cover (1)
- 3.4.1 oil (1)
 3.4.2 paraffin; soluble oil (1)
 3.4.3 none; soluble oil (1)
- 3.5.1 When excessive pressure is needed to drill through materials. (1)
 3.5.2 When drilling results in the ejecting of more than one cutting per flute. (1)
 3.5.3 When the drill becomes blunt it will “screech” as a result of friction. (1)
- 3.6.1 1 (1)
 3.6.2 4 (1)
- [20]

QUESTION 4

- 4.1.1 Drill grinding attachment (1)
 4.1.2 V-Block (1)
 4.1.3 Circular die; die nut; two-piece die (1)
 4.1.4 3-jaw chuck (1)
 4.1.5 Cross-cut chisel (1)
 4.1.6 Rivet set, snap (1)
 4.1.7 Ball pein / pene (1)
 4.1.8 Vernier (1)
 4.1.9 Stillson wrench (1)
 4.1.10 Driving plate (1)
- 4.2.1 Can hold any shape for turning (1)
 4.2.2 Has a better grip, holds the work more securely. (1)
- 4.3.1 Revolving centre (1)
 4.3.2 Fixed centre (1)

- 4.4.1 By wrapping the workpiece or vice jaws with aluminium foil. (1)
 4.4.2 Half-round file (1)
- 4.5.1 Chamfer / taper the end of rod for easy start. (1)
 4.5.2 Hold stock and die perpendicular to workpiece. (1)
 4.5.3 Make full clockwise turns with half anticlockwise turn to break off chips. (1)
 4.5.4 Use lubricant to ease cutting. (1)
- [20]

QUESTION 5

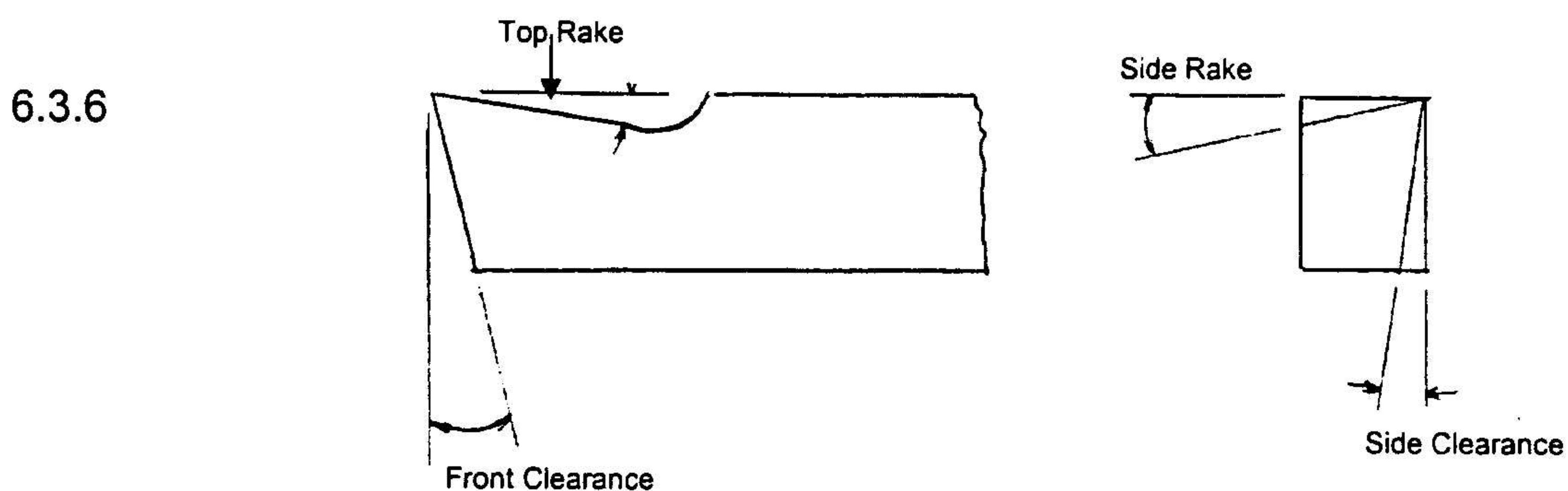
- 5.1.1 Soldering iron must be cleaned and tinned. (1)
 5.1.2 Soldering iron must be hot enough / parent metal also. (1)
 5.1.3 The joint must be chemically clean. (1)
 5.1.4 The plates to be joined must fit perfectly. (1)
 5.1.5 The correct flux must be used. (1)
- 5.2.1 The cleaned parts must be positioned or secured together with wire. (1)
 5.2.2 Flux must be applied to the area to be soldered. (1)
 5.2.3 The soldering iron / bit must be sufficiently heated and tinned. (1)
 5.2.4 The tinned bit is now placed and kept at the start until the solder flows. (1)
 5.2.5 Move slowly along the seam, transferring the heat and adding solder as required. (1)
- 5.3.1 tin (1)
 5.3.2 lead (1)
- 5.4.1 It chemically cleans the metals and prevents oxidation while soldering. (1)
 5.4.2 Reduces surface tension of melted solder, allowing it to flow. (1)
- 5.5.1 Zinc chloride, sal-ammoniac (1)
 5.5.2 Diluted hydrochloric acid (1)
 5.5.3 Zinc chloride, sal-ammoniac (1)
- 5.6.1 Must never be used when soldering electrical apparatus. (1)
 5.6.2 After use on ferrous metal and zinc plate, it must be washed off. (1)
- 5.7 Silver soldering, brazing (1)
- [20]

QUESTION 6

- 6.1 A – screw cutting / screwthreading / threading tool (1)
 B – parting / parting off / cut off tool (1)
 C – parallel turning / round nose tool (1)
 D – right facing tool (1)
 E – taper turning tool (1)
 F – knurling tool (1)

- 6.2.1 The grinding angles must be grounded correctly.
 - 6.2.2 The profile of the tool must be correct and sharp.
 - 6.2.3 The tool must be adjusted to centre height.
 - 6.2.4 The tool must not protrude too far from the tool holder.
 - 6.2.5 The machine must be steady.
 - 6.2.6 All movable slides must be adjusted correctly.
- } any 3 (3)

- 6.3.1 Tailstock (1)
- 6.3.2 To support the workpiece during the turning process with the help of centres (1)
- 6.3.3 Revolving centre, fixed centre, chucks, Morse taper shanks (2)
- 6.3.4 C – tailstock lock (1)
D – tailstock handwheel (1)
- 6.3.5 To prevent the tailstock from moving during turning operations (1)



Cutting angles of lathe tool

(4)
[20]

QUESTION 7

- 7.1 A – pressure gauges (1)
B – pressure regulating screw (1)
C – hoses / pipes (1)
D – nozzle (1)
E – blowpipe (1)

- 7.2.1 Work in a well ventilated area (3)
 - 7.2.2 Gas cylinders must be secure and in a vertical position.
 - 7.2.3 Use protective clothing.
 - 7.2.4 Check gas cylinders and connection for leaks or damage.
 - 7.2.5 Sparks, excessive heat and electric current must not be brought in contact with the equipment.
- } any 3

- 7.3.1 Open acetylene and light using a spark lighter (1)
- 7.3.2 Adjust by increasing or decreasing the acetylene supply until the flame stops smoking (1)
- 7.3.3 Turn on the oxygen, and adjust the supply until the two inner cones of the flame merge (1)
- 7.3.4 You now have a neutral flame (1)

- 7.4.1 Rightward welding (1)
 7.4.2 Leftward welding (1)
- 7.5 Any 3 differences

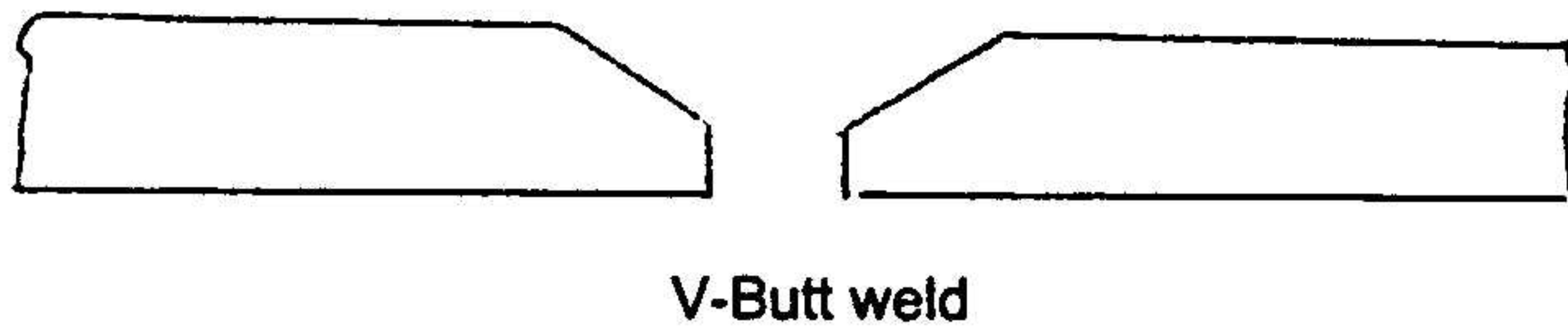
| RIGHTWARD WELDING | LEFTWARD WELDING |
|--|---|
| 1 Start from left to right | 1 Start from right to left |
| 2 Circular movement of welding flame | 2 Zig-zag movement of welding flame |
| 3 Movement and direction of filler rod – right | 3 Movement of filler rod – left |
| 4 Filler rod to work angle 30° - 40° | 4 Filler rod to work angle – 30° - 40° |
| 5 Flame to work angle 40° - 50° | 5 Flame to work angle - 60° - 70° |
| 6 Used for welding 5-8 mm plates steel | 6 Used for welding 3-5 mm plates cast iron; non-ferrous metals |

(6)
[20]

QUESTION 8

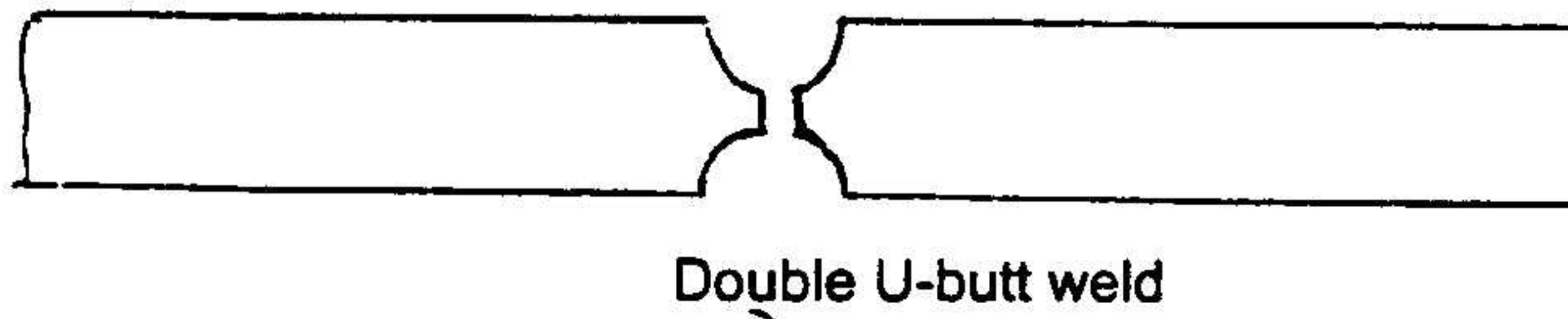
- 8.1.1 Electric arc (1)
 8.1.2 Parent metal (1)
 8.1.3 Electrode (1)
- 8.2.1 Correct choice of electrode (Type)
 8.2.2 Correct choice of electrode size
 8.2.3 Correct welding current
 8.2.4 Correct arc length
 8.2.5 Correct electrode to work angle
 8.2.6 Correct speed of operating movement
 8.2.7 Correct preparation of workpiece
- } any 3 (3)
- 8.3.1
- Produces an electric arc using a terminal in an electric current (1)
 - Provides the filler metal to the weld (1)
- 8.3.2 Stabilises the current / creates slag
- Melts away impurities on the metal surface (1)
 - Facilitates the welding process by increasing the melting speed (1)
 - Forms a gaseous smokescreen, preventing atmospheric gases from contaminating the weld
- } any 2
- 8.4.1 The flame is too hot / the current too strong / electrode too thin (1)
 8.4.2 Root gap too small; current too low or flame too small; electrode too big (1)
 8.4.3 Current too high; incorrect electrode to work angle (1)
 8.4.4 Dirty material; too fast melting of metal; too fast cooling of weld (1)

8.5.1



(2)

8.5.2



(2)

8.6.1 Wear helmet, welding shield

8.6.2 Work in a well ventilated area

8.6.3 Keep cables dry and well insulated

any 2 appropriate safety precautions

(2)

[20]

QUESTION 9

9.1.1 scrap iron; steel scrap

(1)

9.1.2 graphite electrodes

(1)

9.1.3 an arc to be struck

(1)

9.1.4 15 minutes

(1)

9.1.5 quick

(1)

9.1.6 two hours

(1)

9.1.7 oxygen

(1)

9.1.8 electric arc

(1)

9.1.9 3500°C

(1)

9.1.10 tapping process

(1)

9.2

- Used to produce all types of steel
- Temperature can be easily and carefully regulated
- Phosphor and sulphur content can be reduced to very low percentages.
- The slag reduction method ensures that alloys are effectively conserved
- Less flux/ deoxidization agents are needed, resulting in a better, cleaner steel product

any 2 (2)

9.3 corrosion proof;
very strong;
hard; tough

any 2

(2)

9.4 Ferrous

(1)

9.5 False

(1)

9.6 Blast furnace

(1)

9.7

- To improve hardness and strength at high temperatures
 - To improve elasticity and ductility
 - To improve smelting temperature to higher than 1500⁰C
 - To improve tensile strength
 - To improve wear and tear
 - To improve tenacity
 - To improve corrosion resistance
 - To improve grain structure for combating temper brittleness
- } any 3 (3)

[20]

QUESTION 10

- 10.1 Identification of needs: problem identification and goal formulation (2)
 Development of a design proposal: research, investigate ideas, solution (2)
 Organising and Production: production and finishing (2)
 Evaluation: test results; further adjustment if required (2)

- 10.2 To encourage and foster critical and creative thinking skills
 To encourage entrepreneurs who will contribute to the economy
 To express individuality
 To acquire different skills
- } any 2 (2)

- 10.3 Any practical design should be accepted
- proportion
 - aesthetics
 - functionality
 - variety
- } criteria to assess design (6)

- 10.4 arc welding; brazing; bolts & nuts; any other appropriate methods that are suitable for the design (2)

- 10.5 spraypaint; paint; powdercoat; chrome and any other appropriate finishing method (2)

[20]

200÷2 = **100**

GAUTENGSE DEPARTEMENT VAN ONDERWYS

SENIORSERTIFIKAAT-EKSAMEN

MOONTLIKE ANTWOORDE VIR : METAALWERK SG
(Tweede Vraestel)

VRAAG 1

| | | | |
|------|---|------|---|
| 1.1 | D | 1.11 | D |
| 1.2 | A | 1.12 | B |
| 1.3 | D | 1.13 | D |
| 1.4 | D | 1.14 | C |
| 1.5 | C | 1.15 | C |
| 1.6 | A | 1.16 | B |
| 1.7 | B | 1.17 | D |
| 1.8 | D | 1.18 | A |
| 1.9 | C | 1.19 | D |
| 1.10 | B | 1.20 | C |

[20]

VRAAG 2

- 2.1.1 Vals
- 2.1.2 Waar
- 2.1.3 Vals
- 2.1.4 Vals
- 2.1.5 Waar
- 2.1.6 Vals
- 2.1.7 Waar
- 2.1.8 Vals
- 2.1.9 Vals
- 2.1.10 Vals

(10)

- 2.2.1 Die elektrode (sweisstafie) sal aan die werkstuk vasklou, onvoldoende boogvorming en deurdringing.
- 2.2.2 Probleme sal ondervind word om te boor; boor sal op die werkstuk rondhardloop en gly.
- 2.2.3 Gereedskap kan in die masjien ingetrek word, gevaarlik.
- 2.2.4 Gereedskap kan maklik breek.
- 2.2.5 Kloukop sal nie in staat wees om die werkstuk behoorlik vas te hou nie, werkstuk sal nie behoorlik draai nie.
- 2.2.6 Vlam sal met 'n knalgeluid uitdoof.
- 2.2.7 Die allooï sal klein ronde balletjies vorm wat aan die metaal vasklou, die vulmetaal sal nie aan die stammetaal klou nie.
- 2.2.8 Skreegeluid, rook, swak afwerking, oormatige wrywing.
- 2.2.9 Los las, swak las, skag van klinknael kan tussen die plate opswel.
- 2.2.10 Elektrode sal aan die werk vasklou, probleme om 'n boog te vorm.

(10)
[20]

b.o.

VRAAG 3

- 3.1 DXS = dxs
 $125 \times 1000 = 50 \times s$
 $\frac{125000}{50} = s$
 2500 = hoogste snelheid
- DXS = dxs
 $50 \times 1000 = 125 \times s$
 $\frac{50000}{125} = s$
 400 = laagste snelheid (6)
- 3.2 A – aangedrewe katrol (1)
 B – aandryfkatrol (1)
- 3.3.1 Verwyder katroldeksel (1)
 3.3.2 Laat V-bandspanning skiet (1)
 3.3.3 Verander V-bandspanning tot die verlangde snelheid (1)
 3.3.4 Trek band styf en sit deksel terug (1)
- 3.4.1 olie (1)
 3.4.2 paraffien; oplosbare olie (1)
 3.4.3 geen, oplosbare olie (1)
- 3.5.1 Wanneer buitengewone druk nodig is om deur materiale te boor. (1)
 3.5.2 Wanneer boorwerk meer as een baard per groef tot gevolg het. (1)
 3.5.3 Wanneer die boor stomp word, sal dit "skree" as gevolg van wrywing. (1)
- 3.6.1 1 (1)
 3.6.2 4 (1)
- [20]**

VRAAG 4

- 4.1.1 Boorslyphegstuk (1)
 4.1.2 V-blok (1)
 4.1.3 Ronde snymoer, snymoer, tweestuksnymoer (1)
 4.1.4 3-kloukop (1)
 4.1.5 Dwarssnybeitel (1)
 4.1.6 Klinknaelstel (1)
 4.1.7 Balpunthamer (1)
 4.1.8 Nonius (1)
 4.1.9 Bobbejaansleutel (1)
 4.1.10 Dryfplaat (1)
- 4.2.1 Kan enige vorm vashou om te draai. (1)
 4.2.2 Het 'n beter greep, hou werk stywer vas. (1)
- 4.3.1 Draaisenter (1)
 4.3.2 Vaste senter (1)
- 4.4.1 Deur die werkstuk of die kake van die skroef met aluminiumfoelie toe te draai. (1)
 4.4.2 Halfronde vyl (1)

- 4.5.1 Groef/tap die punt van die staaf om maklik te begin. (1)
 4.5.2 Hou stok en snymoer loodreg met die werkstuk. (1)
 4.5.3 Maak volledige kloksgewyse draaie met halwe, antikloksgewyse draaie om splinters af te breek. (1)
 4.5.4 Gebruik smeermiddel om sny te vergemaklik. (1)

[20]

VRAAG 5

- 5.1.1 Soldeerbout moet skoongemaak en vertin word. (1)
 5.1.2 Soldeerbout en moedermetaal moet warm genoeg wees. (1)
 5.1.3 Die las moet chemies skoon wees. (1)
 5.1.4 Die plate wat aan mekaar gelas word, moet perfek pas. (1)
 5.1.5 Die korrekte vloeimiddel moet gebruik word. (1)
- 5.2.1 Die skoongemaakte dele moet geplaas of saamgevoeg word met draad. (1)
 5.2.2 Vloeimiddel moet op die oppervlak wat gesoldeer moet word, aangewend word. (1)
 5.2.3 Die soldeerbout / -punt moet warm genoeg en vertin word. (1)
 5.2.4 Die vertinde punt word nou by die begin geplaas en gelaat totdat die soldeersel vloei. (1)
 5.2.5 Beweeg stadig al met die naat langs en dra die hitte en soldeersel oor soos nodig. (1)
- 5.3.1 tin (1)
 5.3.2 lood (1)
- 5.4.1 Dit maak die metaal chemies skoon en voorkom oksidasie(roes) terwyl daar gesoldeer word. (1)
 5.4.2 Verminder oppervlakspanning van gesmelte soldeersel en laat dit vloei. (1)
- 5.5.1 Sinkchloried salammoniak (1)
 5.5.2 Verdunde swaelsuur (1)
 5.5.3 Sinkchloried, salammoniak (1)
- 5.6.1 Moet nooit gebruik word om elektriese apparaat te soldeer nie. (1)
 5.6.2 Nadat dit op ysterhoudende metaal en sinkplaat gebruik is, moet dit afgespoel word. (1)
- 5.7 silwersoldeer, sweissoldeer (1)

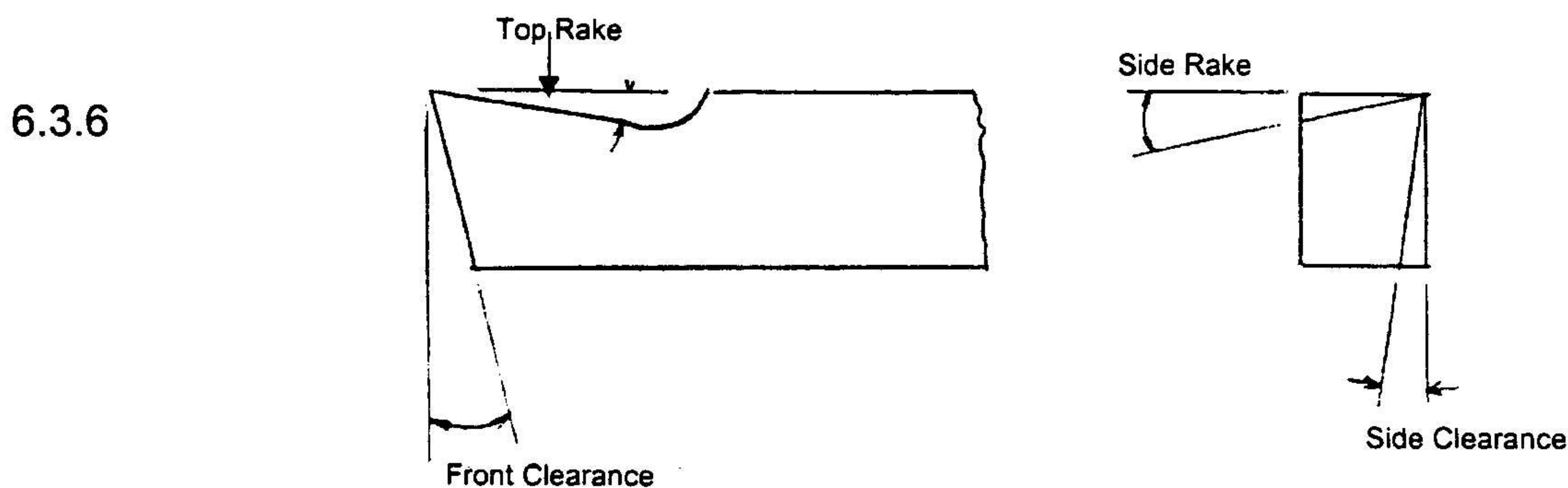
[20]

VRAAG 6

- 6.1 A – skroefsny / skroefdraadsny (1)
 B – skeiding (1)
 C – paralleldraai / ronde neus beitel (1)
 D – regsgerigte beitel (1)
 E – taps draai beitel (1)
 F – kartelwerk beitel (1)

b.o.

- 6.2.1 Die draaihoeke moet korrek gedraai word.
 6.2.2 Die snykant van die beitel moet reg en skerp wees.
 6.2.3 Die gereedskap moet tot die middelste hoogte verstel word.
 6.2.4 Die beitel moet nie te ver uit die gereedskaphouer steek nie.
 6.2.5 Die masjien moet egalig loop.
 6.2.6 Alle beweegbare sleë moet korrek gestel wees.
- } enige 3 (3)
- 6.3.1 Loskopsenter (1)
 6.3.2 Om die werkstuk tydens die draaiproses te ondersteun met behulp van senters (1)
 6.3.3 Draaisenter, vaste senter, kloukoppe, Morse-slagbore (2)
 6.3.4 C – loskopsenterslot (1)
 D – loskophandwiel (1)
 6.3.5 Om te voorkom dat die loskop beweeg tydens die draaiproses. (1)



Snyhoeke van 'n draaibankbeitel

(4)
[20]

VRAAG 7

- 7.1 A – drukmeters (1)
 B – drukreëlskroef (1)
 C – slange (1)
 D – spuitstuk (1)
 E – blaaspyp (1)
- 7.2.1 Werk in 'n goed geventileerde vertrek.
 7.2.2 Gassilinders moet veilig en in 'n vertikale posisie gehou word.
 7.2.3 Gebruik beskermklere.
 7.2.4 Gaan gassilinders en verbindings na vir skade of lekke.
 7.2.5 Vonke, oormatige hitte en elektriese stroom moet nie in aanraking met die toerusting gebring word nie.
- } enige 3 (3)
- 7.3.1 Maak asetilentoevoer oop en steek dit met 'n gasaansteker aan. (1)
 7.3.2 Verstel deur die asetilentoevoer te vermeerder of te verminder totdat die vlam ophou rook. (1)
 7.3.3 Draai die suurstoftoevoer oop en stel die toevoer totdat die twee binneste kerns van die vlam vermeng. (1)
 7.3.4 Jy het nou 'n neutrale vlam. (1)

- 7.4.1 Regssweising (1)
 7.4.2 Linkssweising (1)
- 7.5 Enige 3 verskille

| REGSSWEISING | LINKSSWEISING |
|--|---|
| 1 Begin van links na regs | 1 Begin van regs na links |
| 2 Sirkelbewegings van die sweisvlam | 2 Sig-sag bewegings van sweisvlam |
| 3 Beweeg en rig die vulstaaf regs | 3 Beweeg vulstaaf links |
| 4 Vulstaaf tot werkhoeck 30° - 40° | 4 Vulstaaf tot werkhoeck- 30° - 40° |
| 5 Vlam tot werkhoeck 40° - 50° | 5 Vlam tot werkhoeck 60° - 70° |
| 6 Gebruik om 5-8 mm plate te sweis | 6 Gebruik om 3-5 mm plate te sweis, gietyster en nie-ysterhoudende metaal |

(6)
[20]

VRAAG 8

- 8.1.1 Elektriese boog (1)
 8.1.2 Moedermetaal (1)
 8.1.3 Elektrode/sweisstafie (1)
- 8.2.1 Korrekte keuse van tipe elektrode (sweisstafie) (1)
 8.2.2 Korrekte keuse van grootte elektrode (sweisstafie) (1)
 8.2.3 Korrekte keuse van sweisstroom (1)
 8.2.4 Korrekte keuse van booglengte } enige 3
 8.2.5 Korrekte keuse van elektrode tot werkhoeck
 8.2.6 Korrekte keuse van snelheid van werking
 8.2.7 Korrekte voorbereiding van werkhoeck
- 8.3.1
- Verskaf 'n elektriese boog deur gebruik te maak van 'n elektriese stroom en 'n terminaal. (1)
 - Verskaf die vullermetaal aan die sweislas. (1)
- 8.3.2 Stabiliseer die stroom / skep slak } enige 2
- Smelt enige onsuierhede weg van die metaaloppervlak (1)
 - Maak die sweisproses moontlik deur die smeltspoed te versnel (1)
 - Vorm 'n gasagtige rookskerm en voorkom dat die sweislas deur atmosferiese gasse besoedel word.
- 8.4.1 Die vlam is te warm / die stroom is te sterk / die elektrode (sweisstafie) is te dun. (1)
 8.4.2 Wortelgaping te klein / stroom te swak / vlam te klein / elektrode (sweisstafie) te dik. (1)
 8.4.3 Stroom te hoog / verkeerde elektrode tot werkhoeck (1)
 8.4.4 Materiaal vuil / smelt te vinnig / sweislas koel te vinnig af (1)

**METAALWERK SG
(Tweede Vraestel)**

719-2/2 Q

6

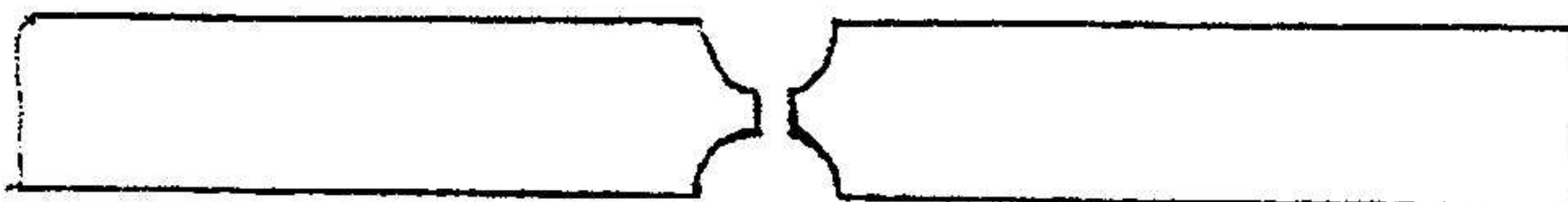
8.5.1



V-stuikswelas

(2)

8.5.2



Dubbel U-stuikswelas

(2)

8.6.1 Dra helm / sweisskerm

8.6.2 Werk in 'n goed geventileerde vertrek

8.6.3 Hou kabels droog en goed geventileerd

} enige 2 toepaslike veiligheidsmaatreëls

(2)

[20]

VRAAG 9

9.1.1 afvalyster / skrootyster

(1)

9.1.2 grafietelektrodes

(1)

9.1.3 'n boog moet getrek word

(1)

9.1.4 15 minute

(1)

9.1.5 vinnig

(1)

9.1.6 twee uur

(1)

9.1.7 suurstof

(1)

9.1.8 elektriese boog

(1)

9.1.9 3500°C

(1)

9.1.10 tapproses

(1)

9.2

- Word gebruik om alle soorte staal te vervaardig
- Temperatuur kan maklik en akkuraat beheer word
- Fosfor en swaelinhoud kan tot baie lae persentasies beperk word.
- Die slak vermindering metode verseker dat allooie effektief bewaar word.
- Minder vloeimiddel / deoksidasiemiddels word benodig wat 'n beter, skoner staalproduk lewer.

(enige twee)

(2)

9.3

roesbestand
baie sterk
hard
taai

enige 2

(2)

9.4 Ysterhoudend

(1)

9.5 Vals

(1)

9.6 Hoogoond

(1)

9.7

- Om hardheid en sterkte teen hoër temperature te verbeter
 - Om elastisiteit en smeebaarheid te verbeter
 - Om smelttemperatuur te verhoog tot meer as 1500⁰C
 - Om treksterkte te verbeter
 - Om slytasie te verminder
 - Om taaigheid te verbeter
 - Om korrosieweerstand te verhoog
 - Om korrelstruktuur te verbeter om aanloopbrosheid te beveg
- enige 3 (3)
- [20]**

VRAAG 10

- 10.1 Identifikasie van behoeftes: probleemidentifikasie en doelformulering (2)
 Ontwikkeling van ontwerpvoorstel: navorsing, ondersoek idees, oplossing (2)
 Organisasie en vervaardiging: produksie en afwerking (2)
 Evaluasie: toetsresultate en verdere verstelling indien nodig (2)
- 10.2 Om kritiese en kreatiewe denke te ontwikkel en aan te moedig }
 Om entrepreneurs wat tot die ekonomie gaan bydra, aan te moedig } enige 2
 Om individualiteit aan te moedig }
 Om verskillende vaardighede aan te moedig } (2)
- 10.3 Enige praktiese ontwerp moet aanvaar word.
 • proporsie }
 • estetiek } kriteria om ontwerp aan te slaan
 • bruikbaarheid }
 • verskeidenheid } (6)
- 10.4 Boogsweis, sweissoldering, bonte en moere, enige ander metode wat op die ontwerp van toepassing is (2)
- 10.5 spuitverf, verf, poeierbedek, verchroom of enige ander toepaslike afwerkingsmetode (2)
- [20]**

200÷2 = 100

EINDE