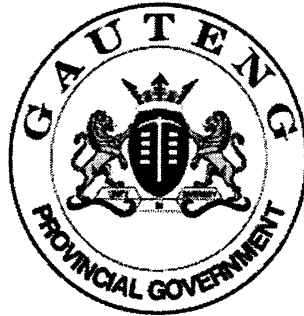


**SENIOR CERTIFICATE EXAMINATION
SENIORSERTIFIKAAT-EKSAMEN**



**OCTOBER / NOVEMBER
OKTOBER / NOVEMBER**

2004

**FARM MECHANICS/
PLAASWERKTUIGKUNDE**



804-2/2

**7 pages
7 bladsye**

FARM MECHANICS SG: Paper 2
Theory



804 2 2

SG

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GAUTENGSE DEPARTEMENT VAN ONDERWYS

SENIORSERTIFIKAAT-EKSAMEN

PLAASWERKTUIGKUNDE SG
(Tweede Vraestel : Teorie)

TYD: 2 uur

PUNTE: 125

INSTRUKSIES:

- Maak seker dat jou eksamennommer op jou antwoordboek verskyn.
 - Al die vrae is VERPLIGTEND.
 - Die vraestel bestaan uit TWEE afdelings, naamlik Afdeling A en B.
 - Afdeling A: Kortvrae – Beantwoord Vraag 1.1 op die **antwoordblad** aan die **binnekant van die omslag** van jou **antwoordboek**.
 - Beantwoord Vraag 1.2 en die res van die vrae in jou antwoordboek.
-
-

AFDELING A

VRAAG 1

Daar word by vrae 1.1 tot 1.10 telkens verskeie moontlike antwoorde verstrek, waarvan slegs EEN korrek is. Toon by elke vraag die korrekte antwoord aan deur 'n kruisie (X) oor die letter teenoor die toepaslike vraagnommer op die antwoordblad te trek.

Voorbeeld:

| | | | |
|---------------------------------------|----------------------------|----------------------------|----------------------------|
| <input checked="" type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D |
|---------------------------------------|----------------------------|----------------------------|----------------------------|

- 1.1 Dit is raadsaam om die _____ te gebruik wanneer swaar voorwerpe opgetel moet word.
- A. bene uitmekaar te hou en die arms
B. rug reguit te hou en die bene
C. bene reguit te hou en die rug
D. bene uitmekaar te hou en die rug
- 1.2 Waarop sal skuimtype brandblussers oor die algemeen gebruik word?
- A. Soliede stowwe
B. Elektriese brande
C. Brandbare vloeistowwe
D. Geeneen van die bogenoemdes nie.

GAUTENG DEPARTMENT OF EDUCATION

SENIOR CERTIFICATE EXAMINATION

FARM MECHANICS SG
(Second Paper : Theory)

TIME: 2 hours

MARKS: 125

INSTRUCTIONS:

- Ensure that your examination number appears on your answer book.
- All questions are **COMPULSORY**.
- The paper consists of **TWO** sections, namely Sections A and B.
- Section A: Short Questions – Answer Question 1.1 on the **answer sheet** on the **inside cover** of the **answer book**.
- Answer Question 1.2 and the remainder of the questions in your answer book.

SECTION A

QUESTION 1

In Questions 1.1 to 1.10, various answers are given of which only **ONE** is correct. Indicate the correct answer to each question by making a cross (**X**) over the letter next to the relevant question number on your answer sheet.

Example:

| | | | |
|--|-----------------------------------|-----------------------------------|-----------------------------------|
| <input checked="" type="checkbox"/> A | <input type="checkbox"/> B | <input type="checkbox"/> C | <input type="checkbox"/> D |
|--|-----------------------------------|-----------------------------------|-----------------------------------|

1.1 It is advisable to keep the _____ when lifting heavy objects.

- A. legs apart and use the arms
- B. back straight and use the legs
- C. legs straight and use the back
- D. legs apart and use the back

1.2 What would a foam-type fire extinguisher be used for generally?

- A. Solid matter
- B. Electrical fires
- C. Flammable liquids
- D. None of above.

- 1.3 Brandstof moet gestoor word in _____ .
- A. die magasyn
 - B. 'n brandvrye kamer
 - C. die meganiese werkwinkel
 - D. 'n koel plek
- 1.4 Die twee gasse wat in die oksiasetileen-sweisapparaat gebruik word, is _____ .
- A. suurstof en asetileen
 - B. suurstof en koolstofdioksied
 - C. koolstofdioksied en stikstof
 - D. stikstof en asetileen
- 1.5 Die funksie van 'n koppelaar is om _____ .
- A. die implement die trekker te verbind
 - B. die ewenaar aan die ratkas te koppel
 - C. die enjin en ratkas aanmekaar te verbind
 - D. die kragtak-as van die trekker aan 'n implement te koppel
- 1.6 Watter tipe stafie word vir hardvlakking gebruik?
- A. 'n Sagtestaal-stafie
 - B. 'n Spesiale stafie vir hardvlakdoeleindes
 - C. 'n Harde wolframstafie
 - D. 'n Gietysterstafie
- 1.7 Die ideale verkoelingstelsel is een wat _____ .
- A. die enjin altyd koud hou
 - B. sorg dat die enjin nooit oorverhit nie
 - C. die enjin gou op sy werktemperatuur bring en dit daar hou
 - D. sonder 'n termostaat werk
- 1.8 Wanneer chroom by staal gevoeg word, maak dit die staal _____ .
- A. meer korrosiebestand
 - B. sagter
 - C. baie bros
 - D. veerkragtig
- 1.9 Die awegaar, ram, vliegwiel en stroperplate, is onderdele van die _____ .
- A. snymasjien
 - B. wrywingskoppelaar
 - C. baalmasjien
 - D. hamermeul

- 1.3 Fuel should be stored in _____ .
- A. the store
 - B. a fireproof room
 - C. the mechanical workshop
 - D. a cool place
- 1.4 The two gases used in the oxy-acetylene welding apparatus are _____ .
- A. oxygen and acetylene
 - B. oxygen and carbon dioxide
 - C. carbon dioxide and nitrogen
 - D. nitrogen and acetylene
- 1.5 The function of a clutch is to _____ .
- A. link an implement to the tractor
 - B. connect the differential to the gearbox
 - C. link the engine and gearbox
 - D. connect the power take-off shaft of the tractor to an implement
- 1.6 What type of rod is used for hard-surfacing?
- A. A mild-steel rod
 - B. A special hard-surfacing rod
 - C. A hard tungsten rod
 - D. Cast iron rod
- 1.7 An ideal cooling system is one which _____ .
- A. always keeps an engine cold
 - B. prevents an engine from overheating
 - C. brings an engine to its working temperature quickly, and keeps it there
 - D. works without a thermostat
- 1.8 When chrome is added to steel, the steel becomes _____ .
- A. more resistant to corrosion
 - B. milder
 - C. very brittle
 - D. springier
- 1.9 The auger, ram, flywheel and stripper plates are parts of the _____ .
- A. mowing machine
 - B. friction clutch
 - C. hay baler
 - D. hammer mill

- 1.10 Die kragaftak-as is deel van die _____ .
- A. transmissiestelsel
 - B. kragremstelsel
 - C. enjin
 - D. ewenaar
- (10)
- 1.11 Toon aan of die volgende stellings WAAR of ONWAAR is. Skryf slegs die woorde **WAAR** of **ONWAAR** teenoor die ooreenstemmende vraagnommer in jou antwoordboek neer.
- 1.11.1 Die koperlaar stel die operateur in staat om die aandrywing van die enjin na die res van die transmissiestelsel na willekeur te koppel en te ontkoppel.
- 1.11.2 Die kapsuletipe termostaat is met alkohol gevul.
- 1.11.3 'n Lae watervlak in die verkoelingstelsel kan lei tot oorverhitting van die stelsel.
- 1.11.4 Vlekvrye staal is bestand teen korrosie.
- 1.11.5 Inkarteling kom gewoonlik op die ent van 'n sweislopie voor.
- 1.11.6 Die dompelpomp het baie instandhouding nodig.
- 1.11.7 Die onafhanklike kragaftak-as kan gestop word terwyl die trekker bly voortbeweeg.
- 1.11.8 Die termohewel-verkoelingsstelsel is redelik eenvoudig, aangesien daar geen waterpomp in die stelsel aangetref word nie.
- 1.11.9 Die gesinchroniseerde ratkas word algemeen in motors en vragmotors aangetref.
- 1.11.10 Die funksie van die vonkverdeler is om die verdelerpunte op die regte tydstip oop en toe te maak.

TOTAAL VIR AFDELING A:

(10)

[20]

1.10 The power take-off shaft is part of the _____ .

- A. transmission system
- B. power-brake system
- C. engine
- D. differential

(10)

1.11 Indicate whether the following statements are TRUE or FALSE. Write only the words **TRUE** or **FALSE** next to the corresponding question number in your answer book.

1.11.1 The clutch enables the operator to engage or disengage the drive of the engine to the rest of the transmission system at will.

1.11.2 The capsule-type thermostat is filled with alcohol.

1.11.3 A low water level in the cooling system can lead to the overheating of the system.

1.11.4 Stainless steel is corrosion resistant.

1.11.5 Undercutting is usually found in the end of a welding run.

1.11.6 The submersible pump needs a lot of maintenance.

1.11.7 The independent power take-off shaft can be stopped while the tractor continues moving.

1.11.8 The thermosiphon cooling system is quite simple because of the absence of a water pump in the system.

1.11.9 The synchronised gearbox is commonly used on cars and trucks.

1.11.10 The function of the distributor is to open and close the contact points at the right moment.

(10)

TOTAL FOR SECTION A:

[20]

AFDELING B

VRAAG 2

- 2.1 Noem VIER tipes sweislopies. (4)
- 2.2 Noem die DRIE posisies van pypsweising. (3)
- 2.3 Verduidelik kortliks wat jy onder elk van die volgende terme of begrippe verstaan:
- 2.3.1 Adhesie (2)
- 2.3.2 Krimping van sweislasse (2)
- 2.3.3 Boogsweising (3)
- 2.4 Noem VIER redes waarom 'n snykoelmiddel gebruik moet wanneer daar met by die senterdraaibank gewerk word. (4)
- 2.5 Verduidelik waarom hittebehandeling van staal nodig is. (3)
- 2.6 Verduidelik die volgende twee eienskappe by vlekvrystaal en sagtestaal:
- 2.6.1 Duursaamheid (4)
- 2.6.2 Korrosiebestandheid (4)
- [25]

VRAAG 3

- 3.1 Teken die volgende tabel in jou antwoordboek oor en vergelyk die dompelpomp, draaiskroefpomp en sentrifugale pomp.

| | | DOMPELPOMP | DRAAISKROEF-POMP | SENTRIFUGALE POMP |
|-------|--------------|------------|------------------|-------------------|
| 3.1.1 | Installasie | | | |
| 3.1.2 | Duursaamheid | | | |
| 3.1.3 | Aandrywing | | | |
| 3.1.4 | Lewering | | | |
| 3.1.5 | Doel | | | |

3 x 5 = (15)

SECTION B

QUESTION 2

- 2.1 Name FOUR types of welding motions. (4)
- 2.2 Name the THREE positions of pipe welding. (3)
- 2.3 Briefly explain what you understand by each of the following terms or concepts:
- 2.3.1 Adhesion (2)
- 2.3.2 Shrinking of welding joints (2)
- 2.3.3 Arc welding (3)
- 2.4 State FOUR reasons why a cutting lubricant should be used when working on a centre lathe. (4)
- 2.5 Explain why steel needs heat treatment. (3)
- 2.6 Explain the following two characteristics with reference to stainless steel and mild steel:
- 2.6.1 Durability
- 2.6.2 Being resistant to corrosion (4)
- [25]**

QUESTION 3

- 3.1 Redraw the table below in your answer book and compare the submersible pump, the roto-lift pump and the centrifugal pump.

| | | SUBMERSIBLE PUMP | ROTO-LIFT PUMP | CENTRIFUGAL PUMP |
|-------|--------------|-------------------------|-----------------------|-------------------------|
| 3.1.1 | Installation | | | |
| 3.1.2 | Durability | | | |
| 3.1.3 | Drive | | | |
| 3.1.4 | Output | | | |
| 3.1.5 | Purpose | | | |

3 x 5 = (15)

3.2 Teken die volgende tabel in jou antwoordboek oor en vergelyk die lugverkoelde enjin en die waterverkoelde enjin.

| | | LUGVERKOELDE ENJIN | WATERVERKOELDE ENJIN |
|-------|-------------|--------------------|----------------------|
| 3.2.1 | Verkoeling | | |
| 3.2.2 | Temperatuur | | |
| 3.2.3 | Waaier | | |
| 3.2.4 | Gewig | | |
| 3.2.5 | Konstruksie | | |

5 x 2 = (10)
[25]

VRAAG 4

Pas elke **item** in **Kolom A** by die **sinoniem** of logies verwante **konsep** in **Kolom B**. Skryf slegs die vraagnommer 4.1. tot 4.10 neer en daarnaas die letter van die konsep uit Kolom B, bv. 4.11N.

| KOLOM A | | KOLOM B | |
|---------|----------------|---------|------------------------|
| 4.1 | Suurstof | A. | Sentrifugale pomp |
| 4.2 | Onderhands | B. | Kragaftak-as |
| 4.3 | Stuwer | C. | Remme |
| 4.4 | Oprapers | D. | Vergasser |
| 4.5 | Kruiskoppeling | E. | Dompelpomp |
| 4.6 | Nivileerkas | F. | Oksidasie |
| 4.7 | Hoofsilinder | G. | Draaibank |
| 4.8 | Venturi | H. | Elektries |
| 4.9 | Sweislas | I. | Hidrouliese kragligter |
| 4.10 | Skort | J. | Kohesie |
| | | K. | Krimping |
| | | L. | Baalmasjien |
| | | M. | Sweismetode |

[10]

3.2 Redraw the table below in your answer book and compare the air-cooled engine and the water-cooled engine.

| | | AIR-COOLED ENGINE | WATER-COOLED ENGINE |
|-------|--------------|--------------------------|----------------------------|
| 3.2.1 | Cooling | | |
| 3.2.2 | Temperature | | |
| 3.2.3 | Fan | | |
| 3.2.4 | Weight | | |
| 3.2.5 | Construction | | |

5 x 2 = (10)
[25]

QUESTION 4

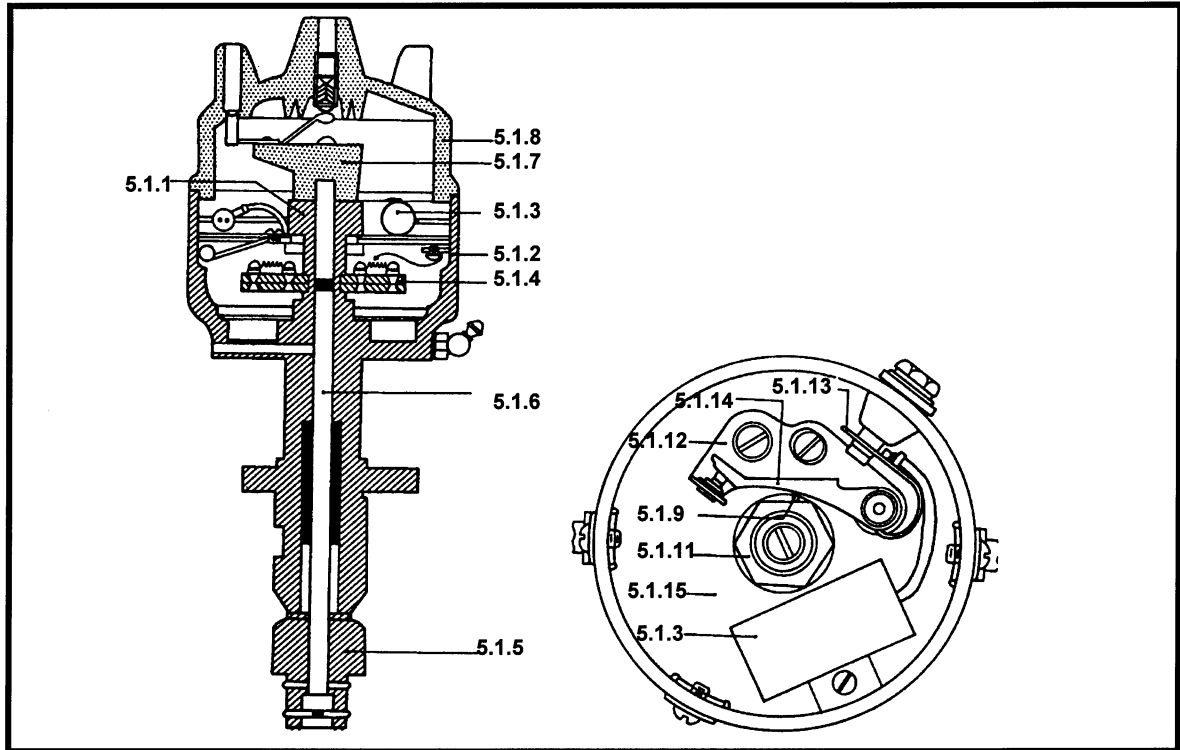
Match each **item** in **Column A** with a **synonym** or logically related **concept** in **Column B**. In your answer book, first write down the item number from 4.1. to 4.10 and next to it the letter of the concept from Column B. e.g. 4.11.N

| COLUMN A | | COLUMN B | |
|-----------------|-----------------|-----------------|----------------------|
| 4.1 | Oxygen | A. | Centrifugal pump |
| 4.2 | Down hand | B. | Power-take-off-shaft |
| 4.3 | Impeller | C. | Brakes |
| 4.4 | Pick-up prongs | D. | Carburettor |
| 4.5 | Universal | E. | Submersible pump |
| 4.6 | Levelling box | F. | Oxidation |
| 4.7 | Master cylinder | G. | Lathe |
| 4.8 | Venturi | H. | Electric |
| 4.9 | Welded joint | I. | Hydraulic lift |
| 4.10 | Separate | J. | Cohesion |
| | | K. | Shrinking |
| | | L. | Hay baler |
| | | M. | Welding method |

[10]

VRAAG 5

- 5.1 Gee die name vir elk van die onderdele van die vonkverdeler genummer 5.1.1 tot 5.1.15. Skryf net die letter en die naam van die onderdeel langs die nommer in jou antwoordboek neer. (15)



- 5.2 Verduidelik die funksie van die vonkverdeler. (5)
- 5.3 Wat word bedoel met die term **standaardisasie**? Verduidelik aan die hand van 'n voorbeeld. (5)

[25]

VRAAG 6

- 6.1 Verduidelik die werking van die baler vandat die hooi in die windry opgetel word totdat die baal by die baler uitgestoot word. Noem die onderskeie onderdele, asook die funksie van elkeen. (10)

- 6.2 Vergelyk in tabelvorm die voordele van die ramtype baler bo die ronde baler. (10)

[20]

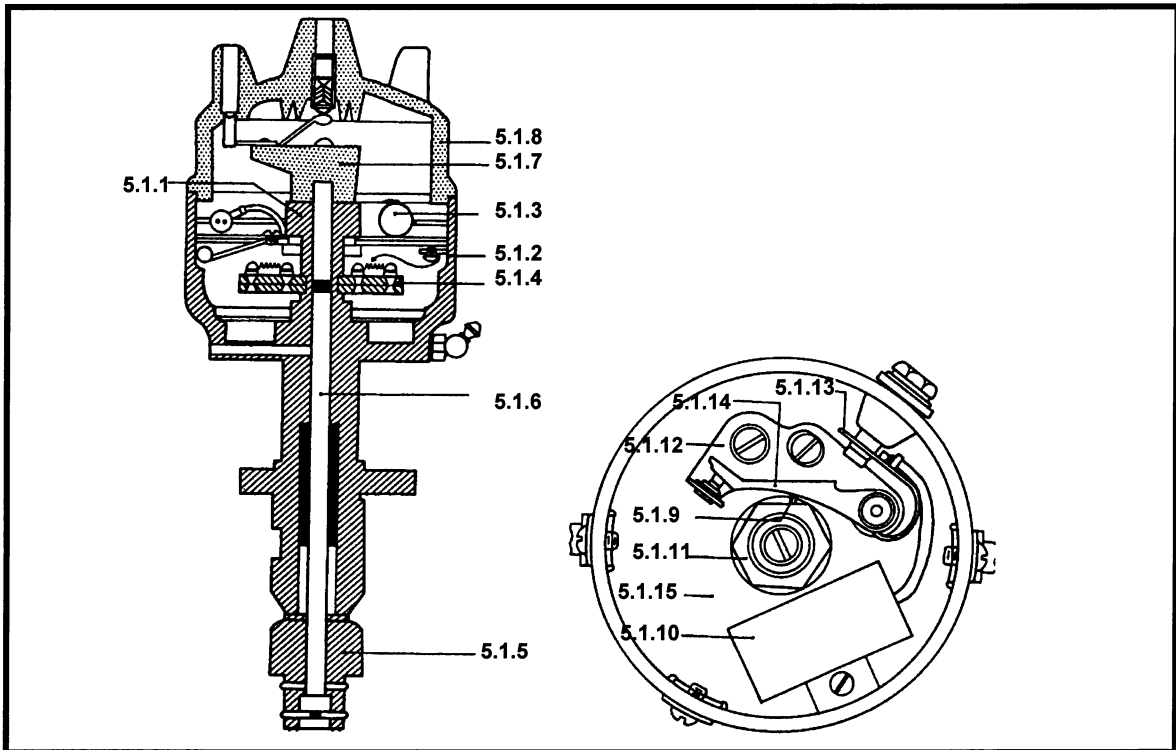
TOTAAL VIR AFDELING B: [105]

TOTAAL: 125

EINDE

QUESTION 5

- 5.1 Give the names for each of the following parts of the distributor numbered 5.1.1 to 5.1.15. Write only the number and the name of the part next to the number in your answer book. (15)



- 5.2 Explain the function of the distributor. (5)
- 5.3 What do you understand by the term **standardization**? Explain by means of an example. (5)
[25]

QUESTION 6

- 6.1 Explain the working of the baler from the time the hay is picked up until the bale slides out of the baler. In your answer, you need to name the various parts and their functions. (10)
- 6.2 In tabular form, compare the advantages of the ram-type baler to the round-type baler. (10)
[20]

TOTAL FOR SECTION B: [105]

TOTAL: 125

END