GAUTENG DEPARTMENT OF EDUCATION
SENIOR CERTIFICATE EXAMINATION

FARM MECHANICS SG
(Second Paper: Theory)

SECTION A
QUESTION 1

1.1	B
1.2	B
1.3	B
1.4	A
1.5	C
1.6	B
1.7	C
1.8	A
1.9	C
1.10	A

(10)

1.11.1	True
1.11.1	False
1.11.3	True
1.11.4	True
1.11.5	False
1.11.6	False
1.1.17	True
1.11.8	True
1.11.9	True
1.11.10	True

(10)

TOTAL FOR SECTION A: [20]

SECTION B
QUESTION 2

2.1
- figure 8 shape
- U-shape
- Zig-Zag shape
- Triangle shape (4)

2.2
- Horizontal fixed (static position)
- Horizontal movable or rolling position
- Vertical position (3)

2.3.1 ADHESION
It is welding metal flowing over base metal without burning into the base metal. (2)

2.3.2 SHRINKING OF WELDING JOINTS
When metal is heated it expands and when it cools down it shrinks. The shrinking of welding joints as well as weld runs, causes distortion of sheets when they cool down. Shrinking takes place in all directions. (2)

2.3.3 ARC WELDING
Electrical energy in the shape an arc is used to provide sufficient heat to fuse two metals. An electrical arc occurs when an electrical current flows through two electrodes which are somewhat apart. The welding rod/electrode is the one electrode. The metal which is welded is the other electrode. (3)

2.4 Cooling the cutting tool.
Cooling the workpiece.
As both cutting and workpiece are cooled, high cutting speeds leading to higher production,are possible.
Shavings are washed from the machine bed.
A smoother finish can be given to the workpiece.
Corrosion of machine bed and travelling carriage is prevented.
Coolants lubricate the machine bed. (4)

2.5 To increase the degree of hardness and strength
To increase elasticity
To soften metal for the working processes to follow
To eliminate the interval tensions (3)

2.6

	STAINLESS STEEL	MILD STEEL
A. Durability	Very durable (does not easily bend or fracture)	Poor (bends easily and wears quickly)
B. Being resistant to corrosion	Very well resistant to corrosion	Poor (rust easily)

(4)
[25]

QUESTION 3

3.1

	SUBMERSIBLE PUMP	ROTARY PUMP	CENTRIFUGAL PUMP
Installation	Easy to install	Easy to install	Not so easy to install
Durability	Under favourable circumstances it can last a lifetime	Under favourable circumstances it can also last a lifetime	Not as durable as the other pumps
Drive	Electrical motor	Driven by any power unit, petrol, or diesel engine or electrical motor	Driven by any power unit, petrol, diesel engine or electrical motor
Output	1-42 cubic metres of water per hour	The supply is in direct ratio to pump speed	The supply is in direct ratio to the pump speed (as well as the type of impeller used)
Purpose	Borehole pump	Pumps water out of very deep boreholes	Pumps water out of rivers, dams, swimming pools

(15)

3.2

	AIR COOLED	WATER COOLED
3.2.1	Difficult to achieve even cooling	It absorbs heat very well
3.2.2	Cooling system will not freeze in cold nights	Circulates easily over a wide temperature range. Risk of being damaged is there, it can freeze up
3.2.3	Much bigger fan needed	Much smaller fan
3.2.4	Light in weight (more weights are needed on an air-cooled tractor)	Heavy in weight
3.2.5	Simpler construction, more compact	Water cooling is used for all types and sizes of engines and is less compact.

(10)
[25]

QUESTION 4

4.1	F
4.2	M
4.3	A
4.4	L
4.5	B

4.6.	I
4.7	C
4.8	D
4.9	K
4.10	J

(10)
[10]

QUESTION 5

5.1.

5.1.1	breaker cam	5.1.6	distributor shaft	5.1.11	breaker cam
5.1.2	metal housing	5.1.7	rotor	5.1.12	earth contact point
5.1.3	condenser	5.1.8	bakelite distributor cap	5.1.13	spring plate
5.1.4	mechanical advance mechanism	5.1.9	friction block	5.1.14	isolated contact point
5.1.5	distributor gear	5.1.10	condenser	5.1.15	mounting plate for contact point

(15)

5.2 a. To open and close the contact points at the right moment and to supply the spark to the spark plug.

b. To supply the spark to the spark-plug at the right time when the piston is under pressure.

c. When engine speed increases, the distributor must advance the spark slightly. (5)

5.3 a. It is understood that all farm implements and/ or tractor spares must comply with certain requirements so that any implement can be coupled to any tractor.

b. Examples:

1.	Belt pulleys:	their drive, direction of rotation, speed and belt width
2.	Power take-off shaft:	direction of rotation, speed, shafts dia.
3.	Three-point mount:	principle is standard
4.	Engines:	have become more standardized

(5)
[25]

QUESTION 6

6.1.1 The pick-up wheel which is wide enough to pick up all the hay from one wind row as the baler moves forward.

6.1.2 The pick-up forks rotate and pick up all the hay onto the stripper plate so that the hay gets to the auger.

6.1.3 The auger continuously rotates and feeds the hay into the baling chamber.

6.1.4 The packing arms helps feed the hay into the baling chamber.

6.1.5 The ram moves forward and backwards and is synchronised with the packer arms. The ram moves forward to compress the hay that has been fed in.

6.1.6 The ram knife then cut the hay of after it is compressed and it is the right size.

6.1.7 The knotting mechanism used for binding two ropes round each bale. (10)

6.2

RAM-TYPE BALER	ROUND TYPE BALER
1. Transport and storage space are optimally utilized	1. One man operation
2. Bales can be handled manually	2. Rope consumption 35-50% lower for similar tonnage
3. Baling process is continuous	3. Simplistic working
4. Bales are stores easily	4. Can bale until rain starts
	5. Roofed storage not necessary

(10)
[20]

TOTAL FOR SECTION B: [105]

TOTAL: 125

END

GAUTENGSE DEPARTEMENT VAN ONDERWYS
SENIORSERTIFIKAAT-EKSAMEN

PLAASWERKTUIGKUNDE SG
(Tweede Vraestel: Teorie)

AFDELING A

VRAAG 1.1

1.1	B
1.2	B
1.3	B
1.4	A
1.5	C
1.6	B
1.7	C
1.8	A
1.9	C
1.10	A

(10)

VRAAG 1.2

1.11.1	Waar
1.11.2	Onwaar
1.11.3	Waar
1.11.4	Waar
1.11.5	Onwaar
1.11.6	Onwaar
1.11.7	Waar
1.11.8	Waar
1.11.9	Waar
1.11.10	Waar

(10)

TOTAAL VIR AFDELING A: [20]

AFDELING B
VRAAG 2

2.1
- figuur 8-lopie
- U-lopie
- Sig-Saglopie
- Driehoeklopie (4)

2.2
- Horisontale vaste posisie
- Horisontale beweegbare of rolbare posisie
- Vertikale posisie (3)

2.3.1 ADHESIE
Sweismetaal vloei oor moedermetaal sonder dat dit in die metaal inbrand. (2)

2.3.2 KRIMPING
Wanneer metaal verhit word, sit dit uit en wanneer dit afkoel, krimp dit. Die krimping van sweislaste, asook sweislopies veroorsaak dat plate verwring as dit afkoel. Krimping vind plaas in alle rigtings. (2)

2.3.3 BOOGSWEISING
Elektriese energie word in die vorm van 'n boog gebruik om die nodige hitte te verskaf wat metale laat saamsmelt. 'n Elektriese boog ontstaan wanneer 'n elektriese stroom vloei deur 2 elektrodes wat effens van mekaar verwyder is. Die sweisstaaf is die een elektrode.
Die metaal wat gesweis word, is die ander elektrode. (3)

2.4 Die beitel word koel gehou.
Werkstuk word koel gehou.
Omdat beide die werkstuk en beitel koel gehou word, is hoë snysnelhede moontlik wat tot 'n verhoging in produksie lei.
Snysels word van die masjienbed afgespoel.
'n Gladder afwerking word aan die werkstuk verleen.
Korrosie (roes) van die masjienbed en slee word voorkom.
Koelmiddels smeer die masjienbed. (4)

2.5 Om hardheid en sterkte te verbeter
Om rekbaarheid te verbeter
Om metale sag te maak vir werksproses wat volg
Om interne spanning op te hef (4)

2.6

	VLEKVRYE STAAL	SAGTE STAAL
A. Duursaamheid	Baie duursaam (buig of breek nie maklik nie)	Swak (buig maklik en slyt maklik weg)
B. Korrosiebestandheid	Baie goed bestand teen korrosie	Swak (Roes baie maklik)

(4)
[25]

VRAAG 3

3.1

	DOMPELPOMP	DRAAISKROEFPOMP	SENTRIFUGALE POMP
Installasie	Maklik	Maklik om te installeer	Nie so maklik om te installeer nie
Duursaamheid	Onder gunstige toestande kan dit 'n leeftyd hou	Ook lewenslank	Nie so duursaam soos die ander pompe nie
Aandrywing	Elektriese motor	Aangedryf deur enige krageenheid, petrol- of dieselenjin, of elektriese motor	Aandrywing deur enige krageenheid, petrol- of dieselenjin of elektriese motor
Lewering	1-42 kubieke meter of water per uur	Lewering is in direkte verhouding met pompspoed	Lewering is in die direkte verhouding met die pomp-spoed (asook die tipe stuwer wat gebruik word)
Doel	Boorgatpomp	Pomp water uit baie diep boorgate	Pomp water uit riviere, damme en swembaddens

(15)

3.2

	LUGVERKOELING	WATERVERKOELING
3.2.1	Moeiliker om egalige verkoeling te verkry	In staat om hitte goed te absorbeer
3.2.2	Verkoelingstelsel sal nie vries tydens koue nagte nie	Sirkuleer maklik oor 'n wyer temperatuur-gebied. Gevaar is wel daar van vries.
3.2.3	Groter waaier word benodig	Kleiner waaier word benodig
3.2.4	Lig (meer gewigte moet aangebring word by 'n lugverkoelde trekker as 'n waterverkoelde trekker)	Swaar
3.2.5	Eenvoudige konstruksie. Meer kompak.	Word by alle groottes en tipe enjins aangetref. Minder kompak.

(10)
[25]

VRAAG 4

4.1	F
4.2	M
4.3	A
4.4	L
4.5	B

4.6.	I
4.7	C
4.8	D
4.9	K
4.10	J

(10)
[10]

VRAAG 5

5.1.

5.1.1	onderbrekernok	5.1.6	verdeleras	5.1.11	onderbrekernok
5.1.2	metaalhulsel	5.1.7	rotor	5.1.12	vaste onderbrekerpunt
5.1.3	kapasitor	5.1.8	Bakelietvonkverdelerdop	5.1.13	veerplaat
5.1.4	Meganiese vervroegingsmeganisme	5.1.9	veselblokkie	5.1.14	beweegbare onderbrekerpunt
5.1.5	verdelerrat	5.1.10	kapasitor	5.1.15	monteerplaat vir onderbrekerpunt

(15)

5.2 a. Om die verdelerpunte op die regte tydstip oop en toe te maak om sodoende die vonk na die regte vonkprop toe te stuur.

b. Om 'n vonk na die regte vonkprop toe te stuur op die regte tyd wanneer die suier onder druk verkeer.

c. Die verdeler moet in staat wees om die tydstip waarop die vonk gelewer word effens te vervroeg wanneer die enjinspoed toeneem. (5)

5.3 a. Dat die plaasimplemente en/of trekkeronderdele aan sekere vereistes moet voldoen, sodat enige implement aan enige trekker gekoppel kan word.

b. Voorbeelde:

1.	Bandkatrolle:	metode van aandrywing, draairigtingspoed en katrolwydte
2.	Kragaftak-asse:	aandrywing, draairigting, asdikte
3.	Driepunt-koppeling:	werking is standaard op alle trekkers
4.	Enjins:	al hoe meer enjins is standard.

(5)
[25]

VRAAG 6

6.1.1 Opraperwiel: wyd genoeg om al die hooi van een windry op te raap terwyl vorentoe beweeg word.

6.1.2 Tande roteer: en al die hooi word op die stroperplate geplaas om hooi by te kry.

6.1.3 Awegaar: roteer aanhoudend en voer hooi in baalkamer in.

6.1.4 Pakker-arms: voer hooi in baalkamer in.

6.1.5 Ram: beweeg vorentoe en agtertoe en is gesinchroniseer met die pakkerarms. Ram beweeg vorentoe en pers (druk) die hooi saam wat ingevoer is.

6.1.6 Ram-mes: Nadat saampersing plaasgevind het, sny die ram-messe die hooi in die regte grootte.

6.1.7 Knoopmeganisme: knoop en bind twee toue om elke baal vas. (10)

6.2

RAMTIPE BALER	RONDE BALER
1. Vervoer en opberging word optimaal benut	1. Eenman-operasie
2. Kan bale met hand hanteer	2. Verbruik 25-50% tou vir dieselfde tonnemaat
3. Baalproses is kontinu	3. Eenvoudige werking
4. Bale maklik gestoor	4. Kan baal tot reën begin
	5. Onderdak opberging nie nodig nie.

(10)
[20]

TOTAAL VIR AFDELING B: [105]

TOTAAL: 125

EINDE