SENIOR CERTIFICATE EXAMINATION



FEBRUARY / MARCH 2007

FARM MECHANICS

SG

Second Paper: Theory

804-2/2 E

FARM MECHANICS SG: Paper 2 Theory



X05

COPYRIGHT RESERVED APPROVED BY UMALUSI



7 pages

804-2/2 W

2

(Second Paper)

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 on the **answer sheet** on the **inside cover** of the **answer book**.
- Answer Question 2 and the rest of the questions in your answer book.

SECTION A

QUESTION 1 MULTIPLE-CHOICE QUESTIONS

In Questions 1.1 to 1.15, various answers are given of which only ONE is correct. Indicate the correct answer to each question by making a cross (X) over the appropriate letter next to the relevant question number on your answer sheet.

Exam	nple 1.1 A B B D	
1.1	The function of a threading dial is to indicate	
	 A. when a screw thread is cut deep enough B. where a piece of wire is to be cut C. where to start cutting a thread D. when a cutting tool should be engaged 	(1)
1.2	The three-point linkage mechanism of a tractor has	
	A. no lifting armsB. one lifting armC. two lifting armsD. three lifting arms	(1)

FARM MECHANICS S	G	
(Second Paper)	804-2/2 W	3

1.3	The power take-off shaft is part of the			
	A. B.	transmission system power-brake system		
	C. D.	engine differential	(1)	
1.4	Tractor	costs can be divided into		
	Α.	fixed and current costs		
	B.	fixed costs and depreciation		
	C.	maintenance costs and fixed costs	(4)	
	D.	repair costs and current costs	(1)	
1.5	The bla	ade of a bulldozer is operated by means of a		
	A.	centrifugal pump		
	B.	single-acting cylinder		
	C.	power take-off shaft		
	D.	double-acting cylinder	(1)	
1.6	The mo	ost positive drive occurs through a drive.		
	A.	chain		
	В.	flat-belt		
	C.	V-belt		
	D.	hydraulic	(1)	
1.7	The lar	gest gear in the differential of a vehicle is called the		
	A.	large gear		
	B.	crown wheel		
	C.	power gear		
	D.	conical gear	(1)	
1.8	The purpose of the differential in a vehicle is to reduce speed and			
	A.	allow the vehicle to run more silently		
	B.	allow the wheels to turn more easily		
	C.	adapt the speed of the wheels, when turning corners		
	D.	prevent wheel spin	(1)	
1.9	Which one of the following metals is the most ductile, malleable and forgeable?			
	A.	Cast iron		
	B.	Mild steel		
	C.	High-carbon steel		
	D.	Chrome-steel	(1)	

A. excessive baling speed B. timing and knotting problem C. lubricating problems D. jamming of the prongs Fuel should be stored in one of the following places: A. The store B. A fireproof room C. The mechanical workshop D. A cool place 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, and keeps it there D. works without a thermostat The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler D. hammer mill		·
C. lubricating problems D. jamming of the prongs Fuel should be stored in one of the following places: A. The store B. A fireproof room C. The mechanical workshop D. A cool place 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, and keeps it there D. works without a thermostat The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler		
D. jamming of the prongs Fuel should be stored in one of the following places: A. The store B. A fireproof room C. The mechanical workshop D. A cool place 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, and keeps it there D. works without a thermostat The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler		The state of the s
Fuel should be stored in one of the following places: A. The store B. A fireproof room C. The mechanical workshop D. A cool place 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, and keeps it there D. works without a thermostat The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler		u de la companya de
A. The store B. A fireproof room C. The mechanical workshop D. A cool place 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, and keeps it there D. works without a thermostat The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler	D.	jamming of the prongs
B. A fireproof room C. The mechanical workshop D. A cool place 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, and keeps it there D. works without a thermostat The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler	Fuel sh	nould be stored in one of the following places:
C. The mechanical workshop D. A cool place 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, and keeps it there D. works without a thermostat The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler		
D. A cool place 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, and keeps it there D. works without a thermostat The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler		•
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, and keeps it there D. works without a thermostat The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler		•
A. always keeps an engine cold B. prevents an engine from overheating C. brings an engine to its working temperature, and keeps it there D. works without a thermostat The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler	D.	A cool place
B. prevents an engine from overheating C. brings an engine to its working temperature, and keeps it there D. works without a thermostat The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler	An ide	al cooling system is one which
C. brings an engine to its working temperature, and keeps it there D. works without a thermostat The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler	A.	always keeps an engine cold
D. works without a thermostat The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler	B.	prevents an engine from overheating
The term standardization suggests that A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler	C.	brings an engine to its working temperature, and keeps it there
A. all farmers should maintain the same standard B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler	D.	works without a thermostat
 B. all products should be marketed in the same manner C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler 	The te	rm standardization suggests that
 C. all implements should fit all makes of tractors D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler 	A.	all farmers should maintain the same standard
 D. the standard of farming may not differ from international standards What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler 	B.	all products should be marketed in the same manner
What would a foam-type fire extinguisher be used for generally? A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler	C.	all implements should fit all makes of tractors
A. Solid matter B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler	D.	the standard of farming may not differ from international standards
 B. Electrical fires C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler 	What v	vould a foam-type fire extinguisher be used for generally?
C. Flammable liquids D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler	A.	Solid matter
D. None of the above. The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler		
The auger, ram, flywheel and stripper plates are parts of a A. mowing machine B. friction clutch C. hay baler		•
A. mowing machine B. friction clutch C. hay baler	D.	None of the above.
B. friction clutchC. hay baler	The au	ger, ram, flywheel and stripper plates are parts of a
C. hay baler	A.	mowing machine
		friction clutch
D. hammer mill	C.	hay baler
	D.	hammer mill

FARM MECHANICS SG		-
(Second Paper)	804-2/2 W	5

QUESTION 2

Match each **item** or **concept** in **Column A** with an **item** or **concept** in **Column B** which has the same meaning or a logical connection with the one in Column A.

In your answer book, write down the number of the item or concept from Column A, and next to it the letter of the item or concept chosen from Column B, e.g. 2.11 N.

COLUMN A		COLUMN B	
2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9	Overhead welding Centre gauge Pressure Venturi Impeller Slip clutch Hay baler Speed relation Power take-off shaft	A B C D E F G H	Overheating Sensitivity mechanism Ng Caterpillar tractor Centre line of rear wheels Timing Hay baler Fins Jet pump
2.10	Spark plug	J K L M	Stages Thread-cutting tool Smaller molten puddle Breaker points

[10]

TOTAL FOR SECTION A: [25]

SECTION B

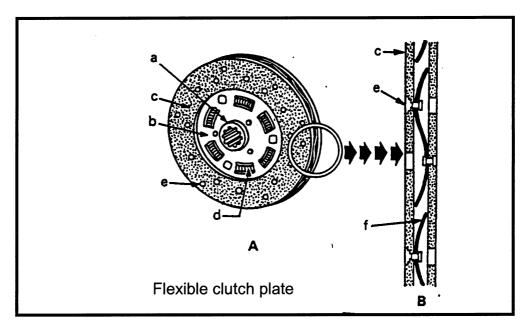
QUESTION 3

3.1	Draw a neat sketch of the following welding defects:	
	3.1.1 Undercutting3.1.2 Porosity3.1.3 Slag inclusion	(4) (4) (4)
3.2	Discuss flat belts under the following headings:	
	3.2.1 SIX advantages 3.2.2 FOUR disadvantages	(6) (4)
3.3	Name THREE advantages of a V-belt.	(3) [25]
	QUESTION 4	
4.1	Explain the working of the baler from the time it picks up the hay until the time the bale slides out of the baler.	(5)
4.2	Explain the difference between the working of the ram-type and the round-type baler.	
4.3	Compare stainless steel and mild steel by setting out your answer in tabular form under the following headings:	
	 4.3.1 Durability 4.3.2 Mouldability 4.3.3 Weldability 4.3.4 Being conductive of heat 4.3.5 Being resistant to corrosion 	(2) (2) (2) (2) (2) [25]
	QUESTION 5	
5.1	Explain by means of a neatly labelled drawing how a centrifugal pump works. NB: The mark allocation for this question will be as follows:	
	 Sketch Labelling Explanation 	(5) (9) (4)
5.2	Explain the purpose of using light SAE-grade oil or heavier transmission oil in tractor hydraulic systems.	(7) [25]

FARM MECHANICS SG		-
(Second Paper)	804-2/2 W	/

QUESTION 6

Study the picture below and answer the questions that follow.



6.1	Label the parts from A to F .	(6)
6.2	Name THREE properties of a good clutch.	(3)
6.3	Explain the THREE types of clutches. Explain briefly the uses of each.	(6)
6.4	In which THREE classes are fires classified? Name the type of fire extinguisher to be used in each class of fire.	(6)
6.5	What precautionary steps must be taken to prevent making contact with blood when treating a person with a bleeding wound?	(2)
6.6	Which TWO factors are important to calculate the speed of the driven pulley?	
		(2) [25]

F4 0 0 1

TOTAL FOR SECTION B: [100]

TOTAL: 125