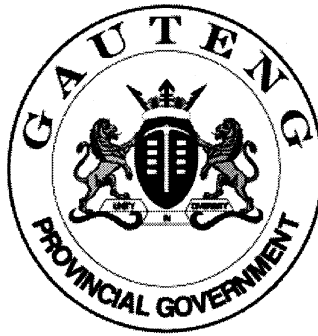


# SENIOR CERTIFICATE EXAMINATION



**FEBRUARY / MARCH**

**2007**

**FARM MECHANICS**

**SG**

**Second Paper : Theory**

**804-2/2 E**

FARM MECHANICS SG: Paper 2  
Theory

7 pages



804 2 2E

SG

**X05**

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- 1.3 The power take-off shaft is part of the \_\_\_\_\_ .
- A. transmission system
  - B. power-brake system
  - C. engine
  - D. differential
- (1)
- 1.4 Tractor costs can be divided into \_\_\_\_\_ .
- A. fixed and current costs
  - B. fixed costs and depreciation
  - C. maintenance costs and fixed costs
  - D. repair costs and current costs
- (1)
- 1.5 The blade 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 most positive drive occurs through a \_\_\_\_\_ drive.
- A. chain
  - B. flat-belt
  - C. V-belt
  - D. hydraulic
- (1)
- 1.7 The largest 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)

- 1.10 The most common problem experienced when using a hay baler is the \_\_\_\_\_ .
- A. excessive baling speed
  - B. timing and knotting problem
  - C. lubricating problems
  - D. jamming of the prongs
- (1)
- 1.11 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
- (1)
- 1.12 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
- (1)
- 1.13 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
- (1)
- 1.14 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.
- (1)
- 1.15 The auger, ram, flywheel and stripper plates are parts of a \_\_\_\_\_ .
- A. mowing machine
  - B. friction clutch
  - C. hay baler
  - D. hammer mill
- (1)

**[15]**

**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.

<b>COLUMN A</b>		<b>COLUMN B</b>	
2.1	Overhead welding	A	Overheating
2.2	Centre gauge	B	Sensitivity mechanism
2.3	Pressure	C	Ng
2.4	Venturi	D	Caterpillar tractor
2.5	Impeller	E	Centre line of rear wheels
2.6	Slip clutch	F	Timing
2.7	Hay baler	G	Hay baler
2.8	Speed relation	H	Fins
2.9	Power take-off shaft	I	Jet pump
2.10	Spark plug	J	Stages
		K	Thread-cutting tool
		L	Smaller molten puddle
		M	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 Undercutting (4)  
 3.1.2 Porosity (4)  
 3.1.3 Slag inclusion (4)
- 3.2 Discuss **flat belts** under the following headings:
- 3.2.1 SIX advantages (6)  
 3.2.2 FOUR disadvantages (4)
- 3.3 Name THREE advantages of a V-belt. (3)  
**[25]**

**QUESTION 4**

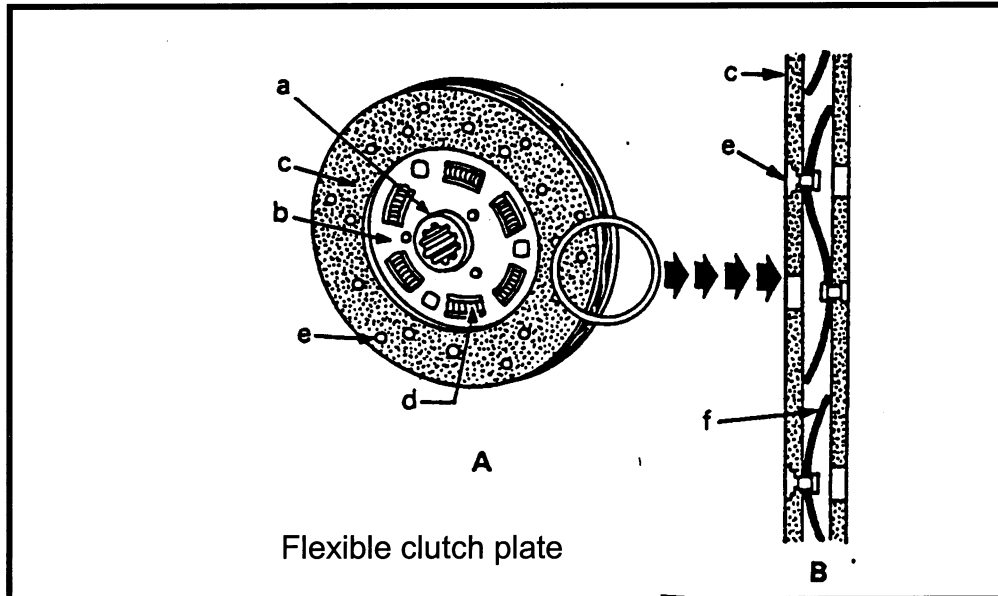
- 4.1 Explain the working of the baler from the time it picks up the hay until the time the bale slides out of the baler. (5)
- 4.2 Explain the difference between the working of the ram-type and the round-type baler. (10)
- 4.3 Compare **stainless steel** and **mild steel** by setting out your answer in tabular form under the following headings:
- 4.3.1 Durability (2)  
 4.3.2 Mouldability (2)  
 4.3.3 Weldability (2)  
 4.3.4 Being conductive of heat (2)  
 4.3.5 Being resistant to corrosion (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 (5)
  - Labelling (9)
  - Explanation (4)
- 5.2 Explain the purpose of using light SAE-grade oil or heavier transmission oil in tractor hydraulic systems. (7)  
**[25]**

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)

(2)  
[25]

TOTAL FOR SECTION B: [100]

TOTAL: 125

END