Education and Sport Development
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NORTH WEST PROVINCE

# PROVINCIAL ASSESSMENT

## GRADE 12

## AGRICULTURAL SCIENCES JUNE 2019

**MARKS: 150**

**TIME: 2½ hours**

**This question paper consists of 13 pages**

**INSTRUCTIONS AND INFORMATION**

1. Answer ALL the questions in the ANSWER BOOK.

2. Start EACH question from SECTION B on a NEW page.

3. Read ALL the questions carefully and answer only what is asked.

4. Number the answers correctly according to the numbering system used in this question paper.

5. Write neatly and legibly.

## SECTION A

## QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Write down the question number (1.1.1-1.1.10) and the correct answer in the ANSWER BOOK provided, for example 1.1.11 D.

1.1.1 The structure in the stomach of a young calf that is responsible for the transportation of milk directly into the abomasum:

A Trachea
B Omasum
C Oesophageal groove
D Ventriculus

1.1.2 …is necessary for the formation of haemoglobin.

A Iron
B Iodine
C Zinc
D Selenium

1.1.3 Chemical substance added to the feed of farm animals that kills the bacteria:

A Antibiotic
B Tranquillizer
C Hormone
D Thyroid regulator

1.1.4 A method to administer medicine using syringe is …

A Oral
B Injection
C Dosing
D Topical

1.1.5 The production system where sheep find their own feed in the Karoo:

A Semi- intensive
B Backyard
C Extensive
D Battery

1.1. 6 The hormone responsible for the development of the graafian follicle:

A Progesterone
B Luteinising hormone
C Follicle Stimulating hormone
D Lutreotropic hormone

1.1.7 The following applies to Lumpy wool:

(i) A fungal disease
(ii) A bacterial disease
(iii) Seen in sheep
(iv) Form scab

Choose the correct combination

A (i), (ii), (iv)
B (i), (iii), (iv)
C (ii), (iii), (iv)
D (i), (ii), (iii)

1.1.8 Foetus is surrounded by the three layers while attached to the uterus. What is the correct sequence of the layers from the outer to the inner layer?

A Amnion, allantois and chorion
D Chorion, amnion and allantois
E Allantois, chorion and amnion
D Chorion, allantois and amnion

1.1.9 The Nutritive Ratio( NR) is the relationship between …

A Protein, carbohydrate and fats
B Protein and minerals
C Carbohydrate and lipids
D Carbohydrates, lipids and minerals

1.1.10 …is tightly closed to prevent infection during pregnancy

A Vulva
B Cervix
C Vagina
D Uterus (2 x 10) (20)

1.2 Indicate whether each of the following descriptions in COLUMN B applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN A. Write **A ONLY, B ONLY, BOTH A and B or NONE** next to the question number (1.2.1-1.2.5) in the ANSWER BOOK, for example 1.2.6 B only.

| COLUMN A | | | COLUMN B |
|---|---|---|---|
| 1.2.1 | A: | Fish meal | Contains a high percentage of total digestible nutrients and less crude fibre |
| | B: | Bone meal | |
| 1.2.2 | A: | Di-oestrus | Takes the average of 21 days |
| | B: | Met-osetrus | |
| 1.2.3 | A: | Warm blooded | Animal bodies are able to maintain a constant temperature |
| | B: | Cold blooded | |
| 1.2.4 | A: | Embryo transplantation | The first stage is to administer FSH and cause a cow to superovulate |
| | B: | Cloning | |
| 1.2.5 | A: | Liver fluke | External parasite/s |
| | B: | Mites | |

(5 x 2) (10)

1.3 Give the correct term for each of the following descriptions. Write only the term next to the question number (1.3.1 – 1.3.5) on the ANSWER BOOK.

1.3.1 The stomach compartment of a cow where most of chemical digestion takes place

1.3.2 Gross energy value of feed minus the energy lost through faeces, urine, digestive gases as well as heat loss

1.3.3 Materials such as sawdust and straw which are placed on the floor of piglets to insulate cold cement floor and absorb moisture

1.3.4 Type of cloning where a new organism is created

1.3.5 Non- identical twins of the opposite sex of which the female is sterile (2 x 5) (10)

1.4 Change the underlined word/s in each of the following statements to make them true. Write the appropriate word next to the question number (1.4.1-1.4.5) on the ANSWER BOOK.

1.4.1 A feed flow program is based on the <u>temperature</u> requirements of animals

1.4.2 <u>Hay</u> is produced when a green crop is kept under anaerobic condition for the fermentation and development of lactic acid

1.4.3 A long, thin steel tool with a sheath for inserting semen in a cow is a <u>ejaculator</u>

1.4.4 Snail is a <u>primary</u> host in the life cycle of a fluke worm

1.4.5 <u>Ectodermic</u> animals maintain a constant body temperature even though the environmental temperature may vary 1 x 5) (5)

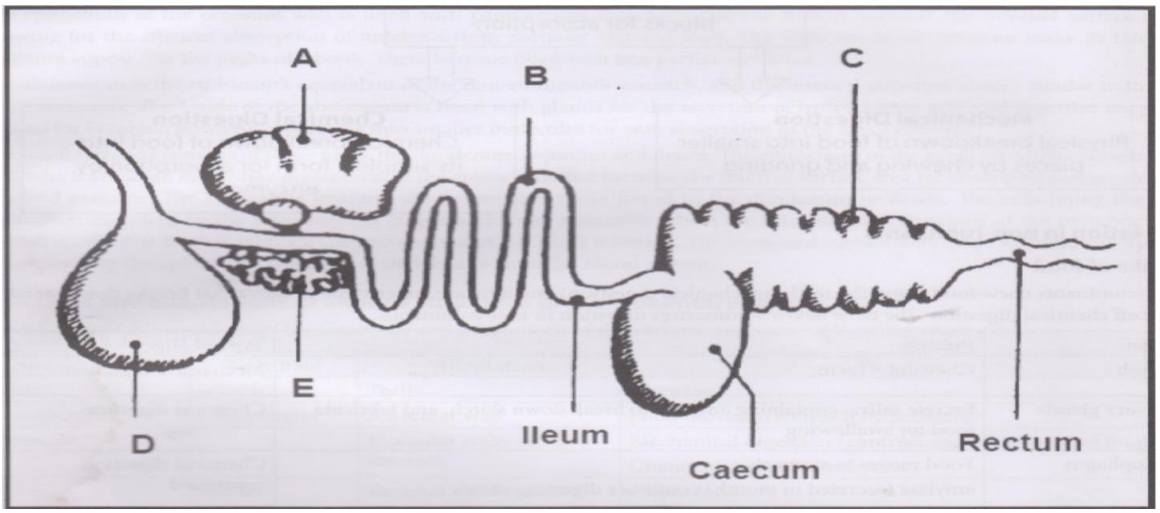
**TOTAL SECTION A: [45]**

**SECTION B**

**QUESTION 2: ANIMAL NUTRITION**

Start this question on a NEW page

2.1 The structure below illustrates the digestive of a farm animal.




2.1.1 Identify the type of farm animal shown in the diagram above (1)

2.1.2 Refer to at least ONE structure in the diagram above to motivate the answer to QUESTION 2.1.1. (1)

2.1.3 Deduce the TWO accessory glands from the diagram above.(2)

2.1.4 Identify the parts labeled B and C. (2)

2.2 The moisture content of lucern hay for cattle in a feedlot is 8%. A herd of dairy cattle consumes 30kg of the lucern hay on average and excretes 12kg of dry manure.

2.2.1 Refer to the information above and calculate the digestibility coefficient of lucern hay. Show ALL the calculations. (5)

2.2.2 Briefly explain how the following factors influence the digestibility of feed:

(a) Preparation of feed (2)

(b) Composition of feed (2)

2.3 Farm animals have certain fodder requirements at various stages of growth and production. The table below represents requirements and resources available over a twelve-month period.

| **ITEM** | **FIRST 6 MONTHS (RAINY SEASON)** | **LAST 6 MONTHS (DRY SEASON)** | **TOTAL** |
|---|---|---|---|
| Need per cow per day | 12kg | 15kg | |
| Feed requirements in 6 months | 108000kg | | |
| Resources available per month (kg) | 1,5 ton/ha | 0,15ton/ha | 415800kg per year |
| Total area for camps ha) | 42 | 42 | 42 |
| Number of animals | 50 | 30 | |

2.3.1 Calculate the total feed required by the animals for six months. Show ALL calculations. (3)

2.3.2 Briefly explain the reason for reducing the number of animals in dry season. (2)

2.3.3 Give TWO sustainable action the farmer needs to take to reduce the impact of the problem in QUESTION 2.3.2 (2)

2.4 The table below shows the crude protein and crude fibre content of different feeds.

| **FEED** | **CRUDE PROTEIN(CP)%** | **CRUDE FIBRECF) %** |
|---|---|---|
| Natural Lucern | 23 | 26 |
| Lucern hay | 14 | 30 |
| Oil-cake meal | 30 | 16 |
| Maize meal | 9 | 2 |
| Sorghum stalk | 4 | 33 |

2.4.1 Deduce from the table above TWO feeds classified as concentrates. (2)

2.4.2 Refer to the table and give a reason for your answer to QUESTION 2.4.1 (1)

2.4.3 Use the data in the table above to draw a bar graph of the crude protein and crude fibre content of the different feeds. (6)

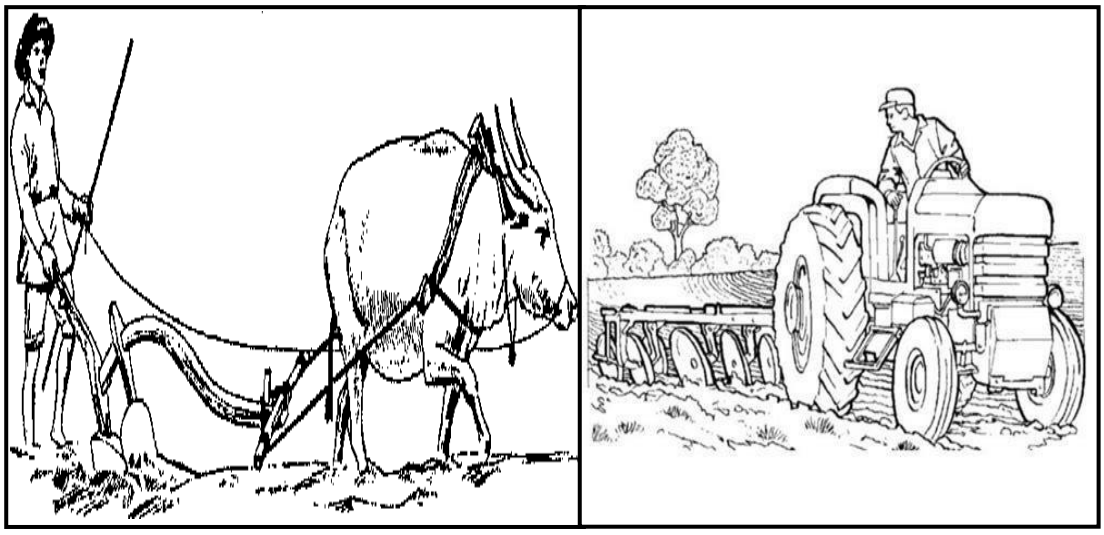
2.4.4 A farmer needs an advice on how to balance a ration by using oil-cake meal and maize meal to get the crude protein (CP) of 16%. Use Pearson Square method to assist this farmer in this regard. (3)

**[35]**

## QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

Start this question on a NEW page.

3.1 The animal farming system followed in South Africa depends on the environment and the level of management



**SYSTEM A** **SYSTEM B**

3.1.1 Name the type of farming systems represented by diagrams above. (2)

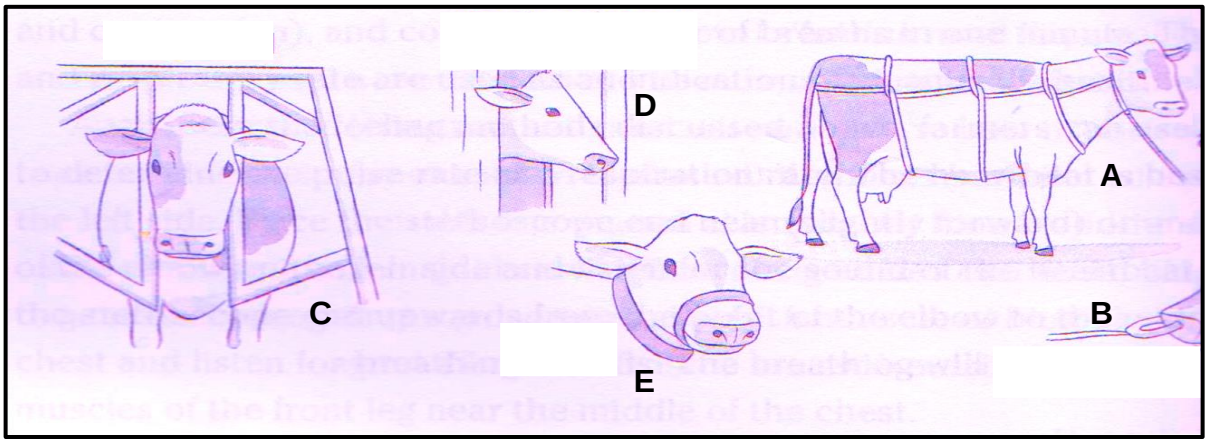
3.1.2 Tabulate the differences between farming system A and B, using the following headings:

(a) Farming scales (2)

( b) Use of technology (2)

3.1.3 Briefly explain ANY TWO impacts of SYSTEM B on the environment. (2)

3.2 Sick animals can be restrained in different ways, depending on the type and size of animal, so that they can be examined or treated. Use the diagrams below and answer questions that follow:




3.2.1 Indicate the equipment that best suits the following description. Give ONLY the correct letter.

( a) Prevents animal from moving. (1)

( b) Lead an animal and tie it to the post (1)

( c) Trap the heads of large animal (1)

3.3 Briefly explain the difference between drenching and balling gun. (2)

3.4

| |
|---|
| In modern farming, handling farm animals form a vital part of the effective management of any herd. Handling farm animals must be done in the most suitable way without wasting valuable time. Knowledge of the behavior of animals provides farmers with insight into their management. |

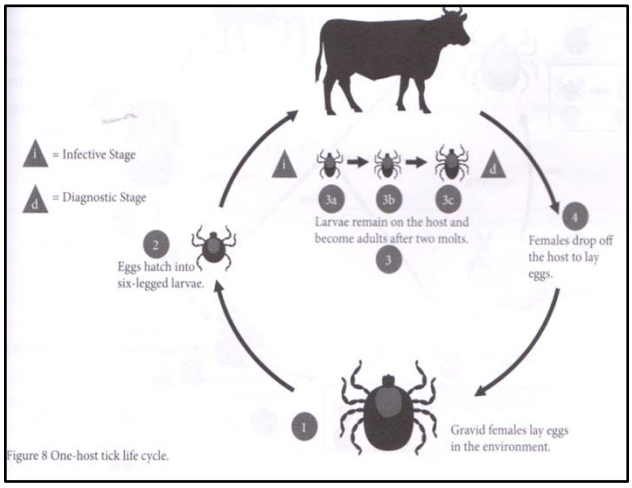
3.4.1 Give THREE tools used for handling large animals. (3)

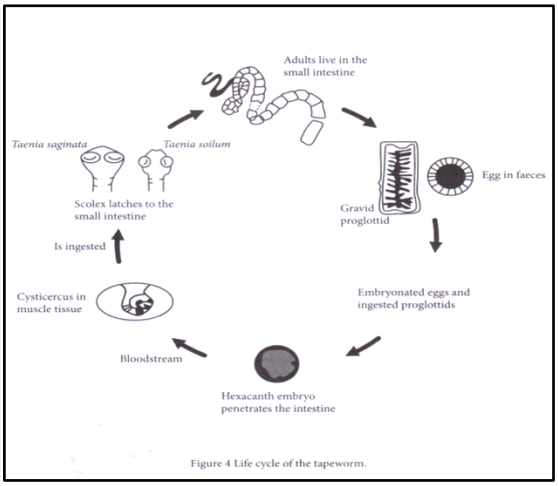
3.4.2 Name THREE management programmes that can provoke the farmer to handle an animal (3)

3.4.3 Differentiate between handling of a sheep to that of a cattle with regard to the number of people (2)

3.5 Outline TWO requirements of a driver who transports animals to the abattoir (2)

3.6 The diagrams below represent two parasites in farm animals.




**PARASITE A** **PARASITE B**

3.6.1 Classify TWO types of parasites illustrated in A and B (2)

3.6.2 Use the diagrams to motivate EACH answer to QUESTION 3.4.1 (2)

3.7

| |
|---|
| Animal diseases are caused by plant and metallic salt poisoning. These toxins accumulate in vital organs, especially the liver, and therefore negatively affect the health of the animal. |

3.7.1 Name the scientific term used in animal health to describe EACH of the following:

(a) Diseases that cannot be transmitted from sick animal to another animal (1)

(b) Disease carrying organism (1)

3.7.2 Name THREE important sources of plant poisoning that mostly affects animals in South Africa (3)

3.7.3 Briefly explain THREE principles that must be considered to in order for animals to remain healthy. (3)

**[35]**

## QUESTION 4: ANIMAL REPRODUCTION

Start this question on a NEW page

4.1 The following schematic representation indicates the formation of the male gametes.

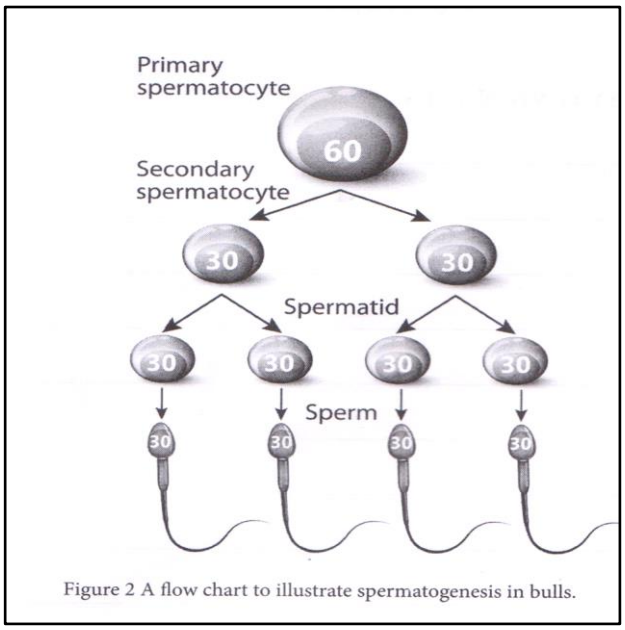



Figure 2 A flow chart to illustrate spermatogenesis in bulls.

4.1.1 State the scientific word used for the schematic representation above. (1)

4.1.2 Define the process indicated in QUESTION 4.1.1 (1)

4.1.3 Briefly explain the difference between the number of chromosomes between the sex cell and the body cell. (2)

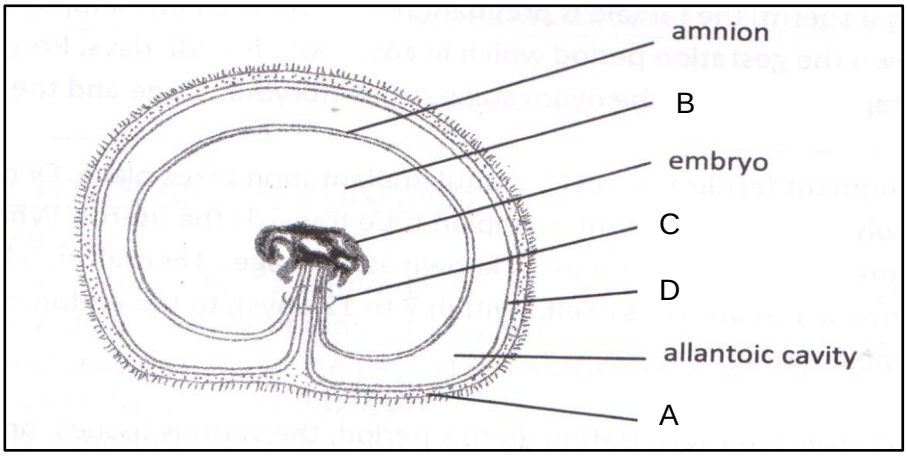
4.1.4 Give ONE function each of the following parts of the sperm:

(a) Mitochondrion. (1)
(b) Acrosome (1)
(c ) Tail (1)

4.1.5 Identify the term used for hidden testicles inside the abdominal cavity (2)

4.2 Briefly explain the path of a sperm cell from the testes until it is released into the vagina. (4)

4.3 The diagram below illustrates embryo development



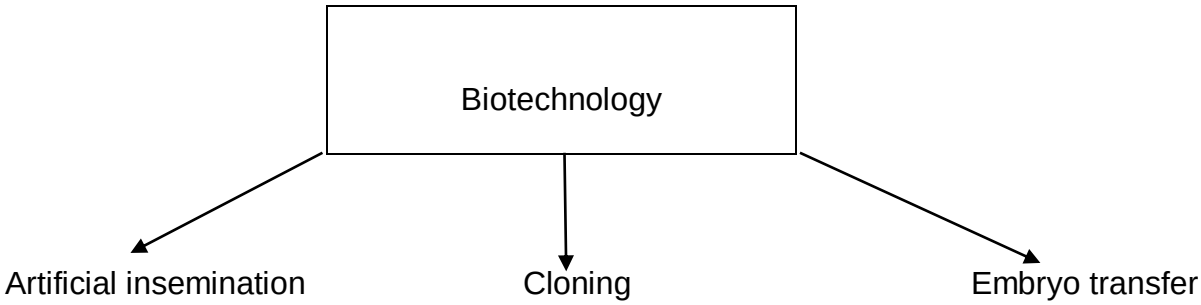

4.3.1 What do we call the pregnancy period of an animal? (1)

4.3.2 Identify part A and C (2)

4.3.3 Give a function of the part labeled:
(a) D (1)

4.4 Every livestock farmer at subsistence or commercial level will often come across an animal that has difficulty in giving birth. Deduce from the statement the term that describes this condition. (2)

4.5 The following shows the schematic representation of scientific methods in animal reproduction.




4.5.1 Briefly explain the term biotechnology. (2)

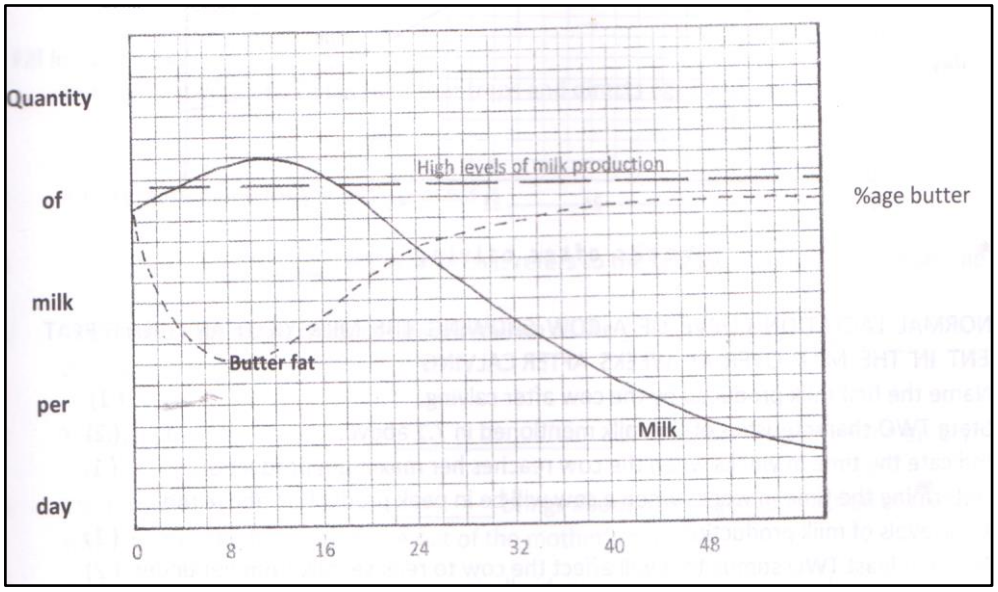
4.5.2 Use the above information to answer the following questions:
(a) The process that uses pistolette. (1)
(b) Use the nucleus (1)
(c) The fertilized ovum is flushed (1)

4.5.3 Discus TWO disadvantages of biotechnology (2)

4.6 Complete the following table on Oestrus cycle by writing the answer next to the letter. (4)

| STAGE | PERIOD | HORMONE RESPONSIBLE | WHERE HORMONE IS SECTRED |
|---|---|---|---|
| Pro- Oestrus | 2-3 days | A | Pituitary gland |
| Met- Oestrus | B | LH | Pituitary gland |
| C | 12-16days | Progesterone | D |

4.7 The diagram below indicates the period of milk production.




4.7.1 Name the structure above. (1)

4.7.2 What do we call the first milk of cow (2)

4.7.3 Looking at the diagram above explain the relationship between butterfat and milk production (2)

**[35]**

**TOTAL SECTION B: 105**
**GRAND TOTAL: 150**