Education and Sports Development

Department of Education and Sports Development
Department van Onderwys en Sport Ontwikkeling
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NORTH WEST PROVINCE

PROVINCIAL ASSESSMENT

GRADE 12

AGRICULTURAL SCIENCES
JUNE 2017

MARKS: 150

TIME: $2\frac{1}{2}$ Hours

This question paper consists of 14 pages.

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. This question paper consists of TWO sections: SECTION A and B.
3. Start EACH question in SECTION B on a NEW page.
4. Read all the questions carefully and answer only what has been asked.
5. Number the answers correctly according to the numbering system used in the question paper.
6. You may use a non-programmable calculator.
7. Show ALL your calculations, including formulae, where applicable.
8. Write neatly and legibly.

SECTION A

QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the most appropriate one by writing the letter next to the question number.
e.g. 1.1.11 D

1.1.1 The ruminants' stomach which corresponds to the glandular stomach of a pig is the…….
A abomasum
B omasum
C rumen
D reticulum

1.1.2 The "fowl molar teeth" is the ……..
A caeca
B omasum
C Ventriculus
D beak

1.1.3 Substances that are needed by livestock for growth and production that lack from their ration and need to be added to it are…..
A roughage
B concentrate
C supplement
D additives

1.1.4 The Biological value of a feed is an index of it's……
A mineral content
B protein content
C lipid content
D energy content

1.1.5 Identify a handling practice which may lead to delayed rigor mortis, poor meat quality and lower grading of the carcass.
A Feeding livestock with high protein levels
B Extremely good handling practice of farm animals
C Slowly driving animals to the abattoir
D Incorrect handling of farm animals which can lead to injury

1.1.6 The following are examples of intensive farming.
A Battery cage and deep-litter systems
B Battery cage and free range system
C Free range and deep-litter systems
D None of these

1.1.7 A bacterial disease that results to the untimely expulsion of an underdeveloped foetus….
A anthrax
B brucellosis
C mastitis
D tetanus

1.1.8 When on 'heat', female animals secrete …….. in order to attract male animals.
A mucus
B oestrogen
C hormones
D pheromones

1.1.9 Name the hormone which is secreted from a gland in the brain responsible for the milk let down reflex.
A oxytocin
B progesterone
C FSH
D Oestrogen

1.1.10 The congenital defect where the testes are underdeveloped/ fail to descend into the scrotum:
A Hypoplasia
B Impotence
C Cryptorchidism
D Hermaphroditism

(10 X2 = 20)

1.2 In the table below a description and two possible answers are given. Decide whether the description in column B is related 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.

e.g. 1.2.6 **Both A and B**

		COLUMN A	**COLUMN B**
1.26	A	High DP content	Concentrate feed suitable for growth, milk production and reproduction
	b	Low fibre content	

COLUMN A			**COLUMN B**
1.2.1	A	NR = 1:6	Feed suitable for fattening of farm animals
	B	NR = 1:10	
1.2.2	A	Molasses	Increases the palatability of poor roughages
	B	Hormones	
1.2.3	A	Cannibalism	Animal behaviour caused by stress
	B	Standstill	
1.2.4	A	Red flag	Tool used when moving animals next to the road
	B	Prodder	
1.2.5	A	Di-oestrus	The period in the oestrus cycle during which the progesterone hormone is secreted
	B	Oestrus	

(5 X 2 = 10)

1.3

Give a word/ term for each of the following descriptions. Write the word /Term next to the question number (1.3.1 – 1.3.5) in the answer book.

1.3.1 The enzyme in the saliva of non-ruminants responsible for the chemical digestion of starch to maltose.

1.3.2 A deficiency of this mineral causes the animal to chew bones

1.3.3 A farmer who produces on a large scale and is profit-oriented

1.3.4 A powerful contraction of the urethra that deposits semen into the vagina of a cow

1.3.5 These diseases are characterized by the repeated occurrence in the same animal

(5 X 2 = 10)

1.4 Change the UNDERLINED WORD(S) in each of the following statements to make them correct/true. Write only the answer next to the question number (1.4.1 -1.4.5) in the ANSWER BOOK.

1.4.1 <u>Pyloric</u> sphincter prevents food from the oesophagus from entering the stomach of anon-ruminant.

1.4.2 Bile helps with the digestion and absorption of the fat-soluble vitamins <u>A, B and C.</u>

1.4.3 <u>Brooding</u> is a strategic plan for livestock farmers to ensure that there is sufficient feed to meet the requirements of farm animals throughout the year.

1.4.4 The inner lining of the uterus is called the <u>myometrium.</u>

1.4.5 <u>Gestation</u> can be referred to as a prolonged and difficult parturition with assistance frequently being required.

(5 X 1 = 5)

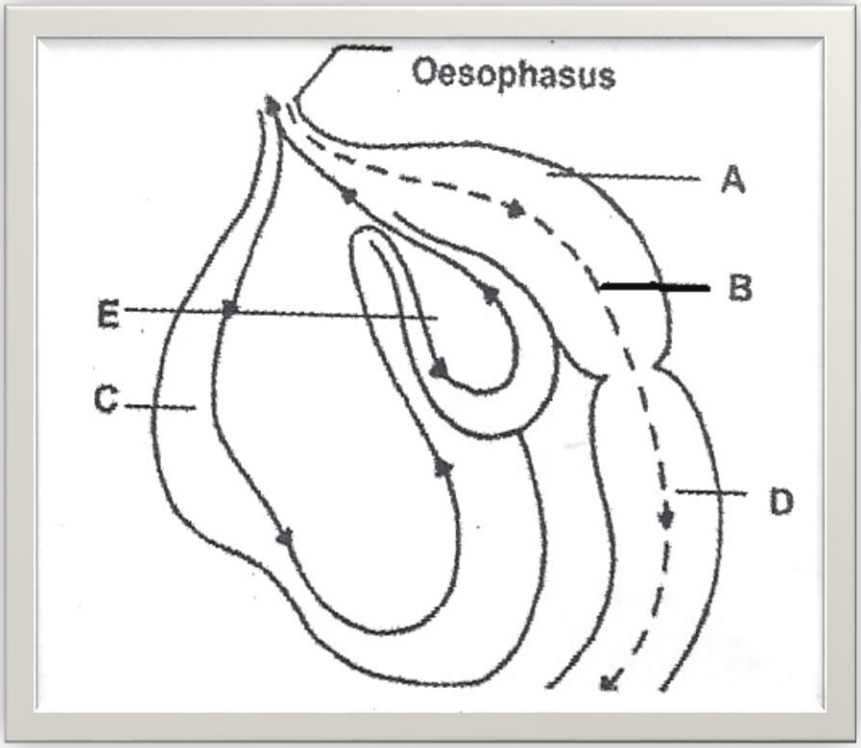
SECTION A TOTAL: 45 MARKS

SECTION B

QUESTION 2: ANIMAL NUTRITION

Start this question on a NEW page

2.1 The diagram below illustrates the process of rumination. Study it carefully and answer the questions that follow.



2.1.1 Label the parts represented by the letter A, C, D and E. (4)

2.1.2 Describe the process of rumination in the parts A and C (2)

2.1.3 Summarize the role played by the microbes that live in parts C and E on cellulose. (3)

2.1.4 Name the condition which occurs when gases accumulate in the stomach. (1)

[10]

2.2 The table below shows the composition of two feeds (A and B).

COMPONENT	FEED A	FEED B
Digestible protein	8%	12%
Carbohydrate	50%	40%
Fats	22%	5%
TDN	------	67%
NR	------	1:5

2.2.1 Determine the Nutritive Ratio (NR) of feed A. (4)

2.2.2 Identify the feed (A or B) that is most suitable for fattening livestock. Justify your answer. (3)

2.2.3 Indicate the feed (A or B) that is most suitable for young growing livestock. Motivate your answer. (3)

[10]

2.3 The table below is a fodder flow program for a period of 120 days during winter.

Livestock type	**Quantity**	**Live mass (kg)**	**Feed intake per livestock (kg)**	**Requirement per day (kg)**	**Requirement for 120 days(tons)**	**Cost: R1127 (per ton)**
Cows	70	500	10	700	A	R 94668.00
Bulls	5	750	15	75	9	R 10143.00
Calves	60	200	4	240	B	R 32457.60
Total	135					R 137268.60

2.3.1 Use the information in the above table to determine **A** and **B.** (4)

2.3.2 Use the data above to calculate the average cost of feeding ONE livestock PER DAY. (3)

[7]

2.4 State the mineral element associated with the following deficiency symptoms.

2.4.1 Pale mucus membrane. (1)

2.4.2 An enlarged thyroid gland. (1)

2.4.3 Hypocalcaemia ("Milk fever"). (1)

[3]

2.5 Agricultural Sciences learners at a certain school formulated the feed in the table below with the given crude protein percentages for calves.

PRODUCTS	CRUDE PROTEIN (%)
Maize meal	9
Soya bean meal	40
Desired ration	20

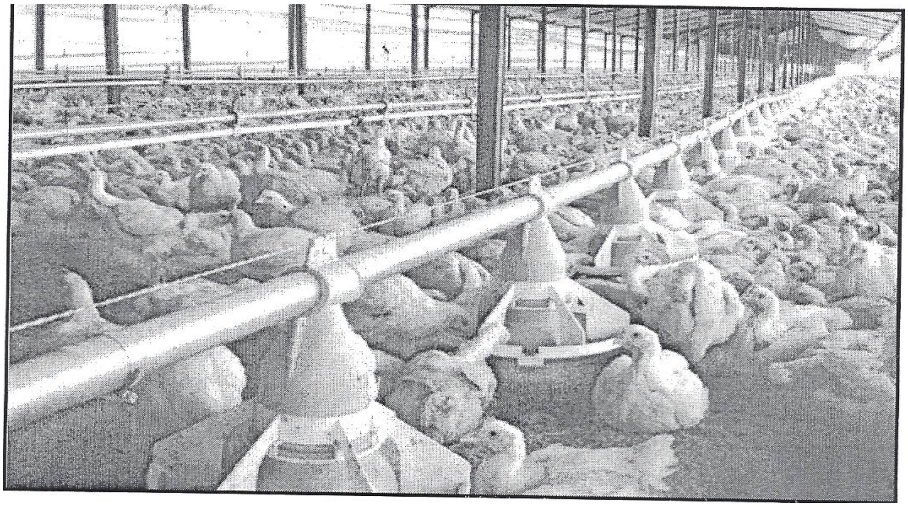
2.5.1 Using Pearson Square method, determine the ration in which the two feeds were mixed. **(5)**

[35]

QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

Start this question on a NEW page

3 .1 The picture below shows a broiler production unit.



The above unit is equipped with the following special equipment for environmental control:

- Foot baths at all entrances
- Foldable side walls
- Electric heaters
- Fans in the roof and walls
- Insulation material on the roof

3.1.1 From the list the above list, choose the equipment that would be used in each of the following managerial practices. Each type of equipment can only be named once. Write only the equipment next to the letter (A - D).

A ➔ To maintain a constant temperature in the broiler unit day and night. (1)
B ➔ The increase the temperature inside the broiler during a sudden drop in environmental temperature. (1)
C ➔ To decrease temperature in the broiler unit on a very hot day. (1)
D ➔ To reduce the possibility of pathogens incidences in the above broiler unit. (1)

3.1.2 State two possible characteristics of an intensive animal production unit based on the above broiler unit. (2)

3.1.3 State the greatest health risk for such broiler units. Justify your answer. (2)

[08]

3.2

THE FUTURE OF SOUTH AFRICAN DAIRY INDUSTRIES

Big supermarkets' shelves had low stocks of dairy products, especially long life milk, in 2012. This has been attributed to the general shortage of milk products globally, drought, increased demand for dairy products and low prices locally. The data on milk production and the average price trends for the years 2012 to 2017 is shown in the table below.

YEAR	PRODUCTION (kilolitres)	PRICE (Rands/litre)
2012	15	11.20
2013	17	11.40
2014	19	11.60
2015	21	11.80
2016	21	11.40
2017	19	11.20

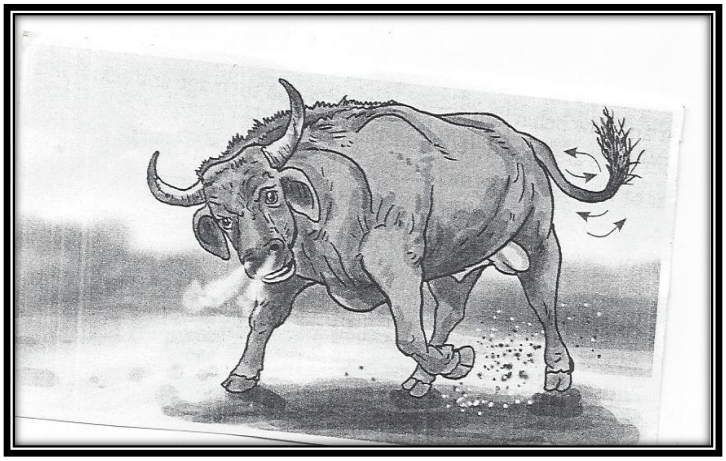
3.2.1 Using the above data draw a bar graph to compare milk production and the price of milk over the above time period. (6)

3.2.2 From the above data, describe the trend of milk production from 2012 to 2016. (2)

3.2.3 From the above that, suggest **TWO** factors that cause dairy farmers to quit the industry. (2)

[10]

3.3 Animal behaviour can be unpredictable and so, workers should remain constantly alert when handling farm animals.



3.3.1 From the above picture, list **THREE signs that shows that the bull is** aggressive or in distress. (3)

3.3.2 Supply **TWO** factors that influence the behaviour of this animal. (2)

3.3.3 Name any **TWO** of the tools that one will recommend for the safe handling of the cattle. (2)

[7]

3.4 The table below indicates some of the indigenous methods used to control diseases and pests in livestock.

Indigenous Control Methods	Frequency Use	Percentage (%)	Frequency use a in degrees
Gall smearing	72	24.7	89^0
Herbs	67	23.0	83^0
Self-diagnosis	70	24.1	87^0
Bush burning	37	12.7	46^0
Herd isolation	17	5.8	21^0
Local concoctions/mixtures	28	9.6	34^0

3.4.1 Identify an indigenous control method that is comparable to the chemical control of diseases. (1)

3.4.2 State the most commonly used methods in controlling pests and diseases by referring to the table above. (1)

3.4.3 State **ONE** way in which bush burning could control infestations of ticks. (1)

3.4.4 Draw a Pie Chart to indicate the frequency of the use of indigenous control methods. (6)

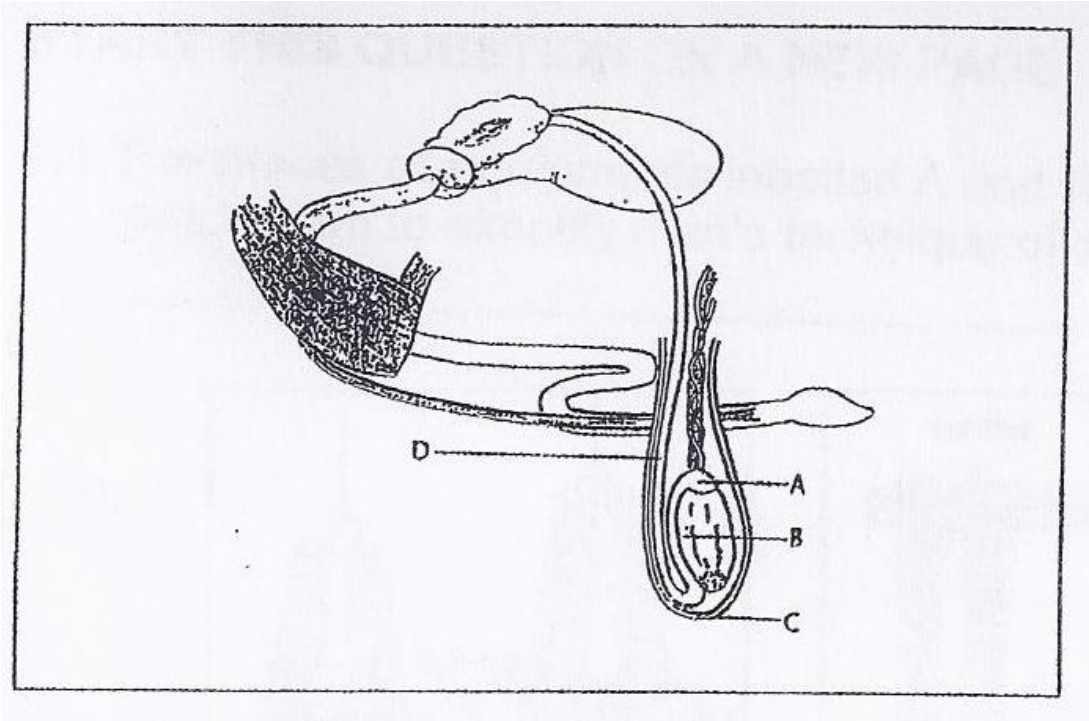
3.4.5 Name **ONE** conventional control measures that a farmer should adopt to restrict infectious diseases. (1)
[10]

[35]

QUESTION 4: ANIMAL REPRODUCTION

Start this question on a NEW page

4.1 Study the diagram of a bull's reproductive system below, then, answer the questions that follow:



4.1.1 Identify the parts marked A to D (4)

4.1.2 Name the hormone secreted by part B (1)

4.1.3 Give two functions of the hormone mentioned in question 3.4.2 (2)

4.1.4 State the condition that results to structure B being retained in the abdominal cavity. (2)

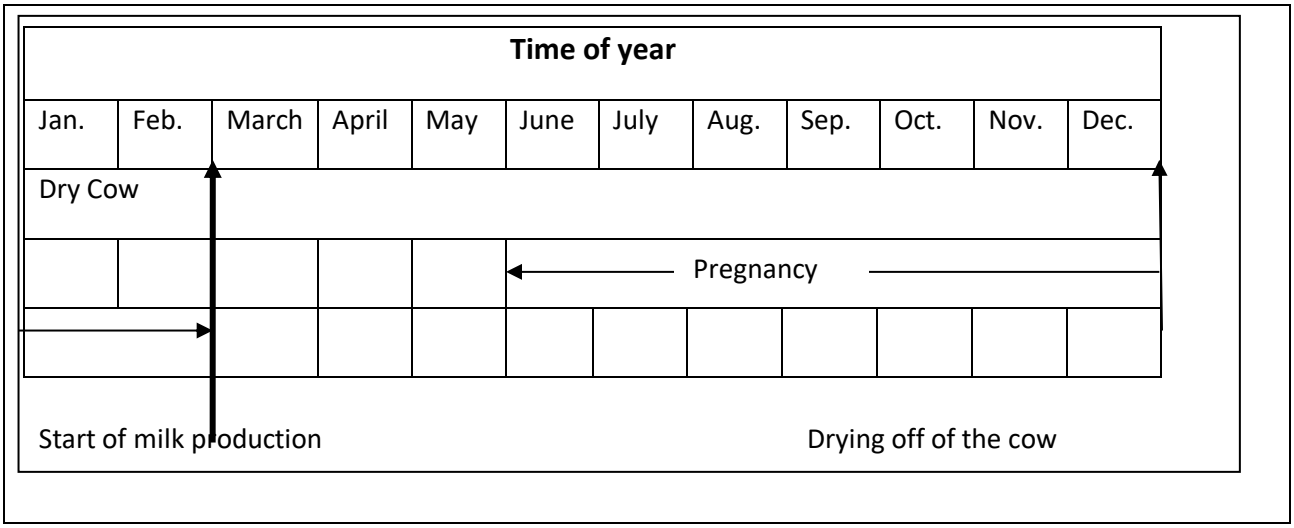
4.1.5 Give the letter of the part that plays a major role in the temperature control of spermatogenesis (1)

[10]

4.2 The data below was taken from a draft management programme for a dairy producer who synchronised the dairy production enterprise.

In the management plan for the year, the farmer tried to make provision for the following aspects:

A	Artificial Insemination
B	Calving
C	Milk Production
D	Conception
E	Pregnancy



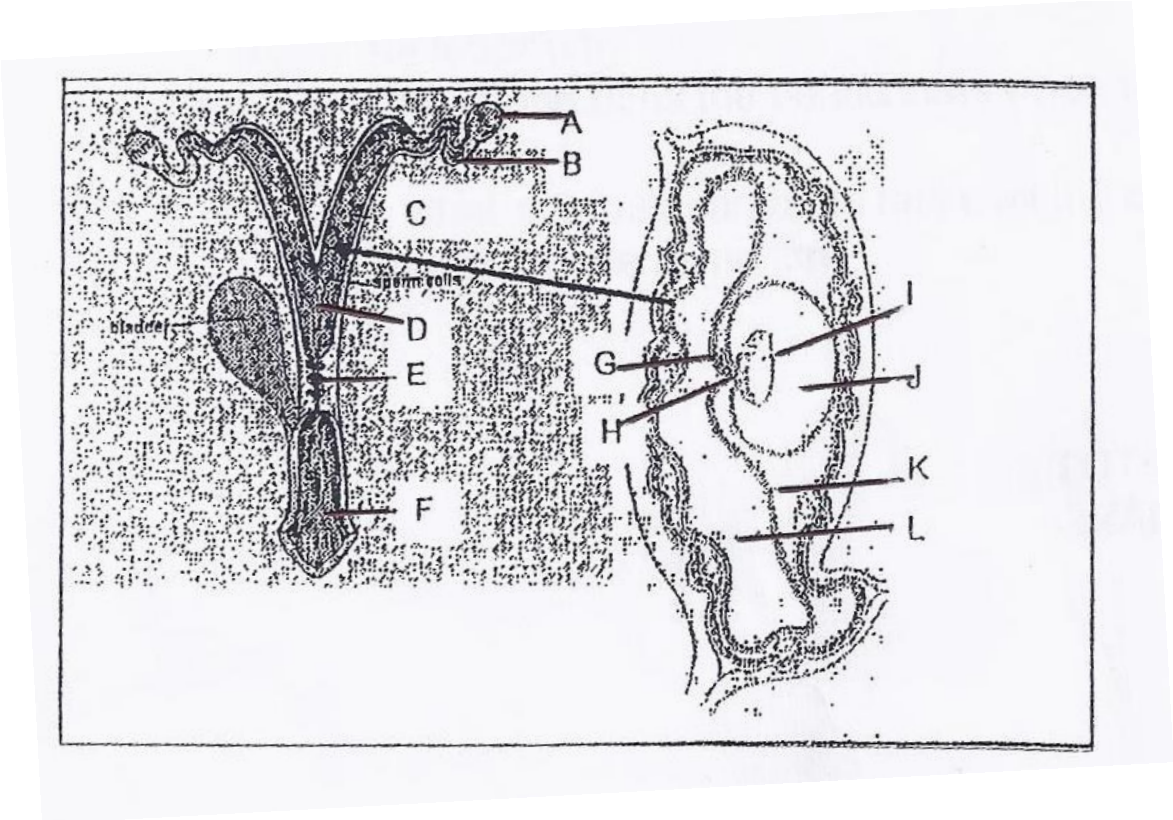
4.2.1 Indicate the two months in which artificial insemination took place in the herd of this dairy farm. (2)

4.2.2 Deduce the process which coincided with the start of milk production in this dairy farm. (2)

4.2.3 Name two ways in which the dairy producer would be affected if the cows that were inseminated at the time indicated in question 4.2.1 did not conceive. (4)

[8]

4.3 The diagram below represents reproductive organs and a stage in the reproduction stage in cattle.



4.3.1 Indicate the correct position where the processes indicated below occur in the female animal to have successful reproduction. Use the letter provided in the above diagram for your answer.

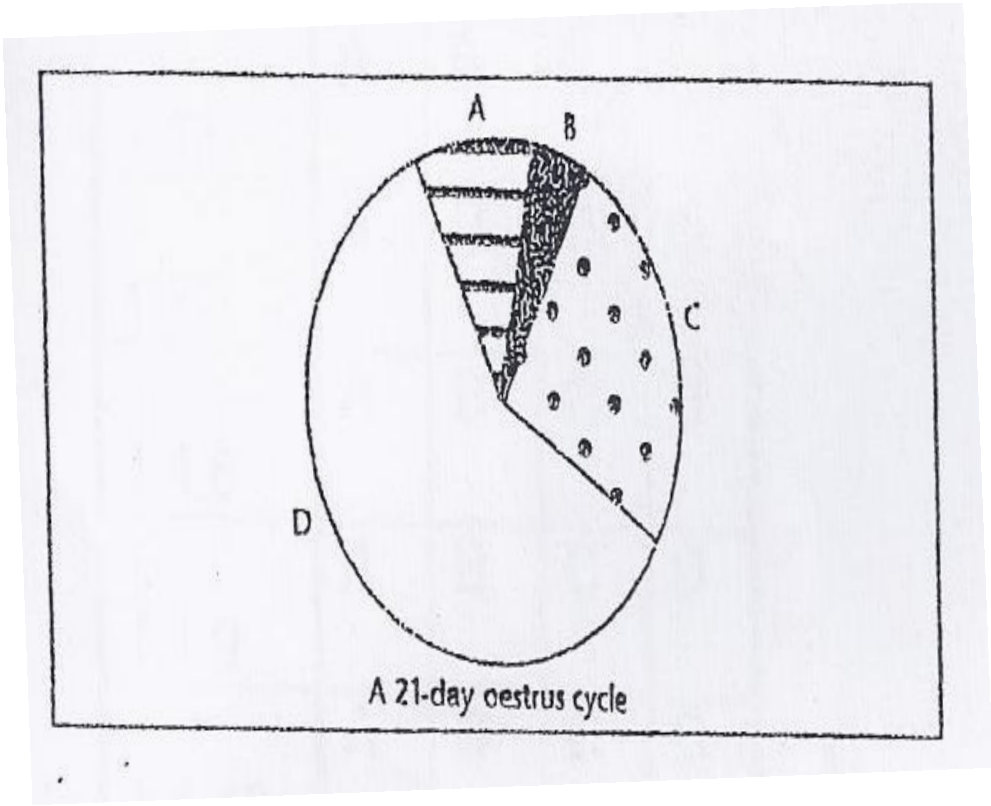
(a) Embryo development
(b) Fertilization
(c) Ovulation
(d) Follicle development (4)

4.3.2. Arrange the following processes in the correct sequence as they occur in the female animal to have successful reproduction.

- Fertilization
- Ovulation
- Follicle development (3)

[7]

4.4 Study The Pie Chart Carefully Before Answering The Questions That Follow.



4.4.1 Identify the phases of oestrus (heat) represented by the letters A to D (4)

4.4.2 Name the phase during which the cow allows the bull to mate.
GIVE the letter only. (1)

4.4.3 Indicate how long does the period last when the cow allows mating to take place. (1)

4.4.4 Explain what a farmer can do to make all the cows come on heat (into oestrus) at the same time. (4)

[10]

[35]

TOTAL SECTION B: 105

GRAND TOTAL: 150