BOARD OF STUDIES
NEW SOUTH WALES

HIGHER SCHOOL CERTIFICATE EXAMINATION

1996

SHEEP HUSBANDRY AND WOOL TECHNOLOGY

2 UNIT

Time allowed—Three hours
(Plus 5 minutes' reading time)

DIRECTIONS TO CANDIDATES

- Write your Student Number and Centre Number at the top right-hand corner of this page, and on each Writing Booklet.

- Board-approved calculators may be used.

Section I (20 marks)

- Attempt BOTH questions.

- Answer the questions in the spaces provided in this paper.

- Allow about 30 minutes for this Section.

Section II (50 marks)

- Attempt ALL questions.

- Answer the questions in the spaces provided in this paper.

- Allow about 90 minutes for this Section.

Section III (30 marks)

- Attempt BOTH questions.

- Answer each question in a *separate* Writing Booklet.

- You may ask for extra Writing Booklets if you need them.

- Allow about 60 minutes for this Section.

EXAMINER'S USE ONLY

Section	Question	Mark
I	1	
I	2	
II	3	
II	4	
II	5	
II	6	
II	7	
III	8	
III	9	

SECTION I
SPECIAL TOPIC
(20 Marks)

Attempt BOTH questions.

Each question is worth 10 marks.

In each question, parts (a), (b), and (c) are of equal value.

Answer the questions in the spaces provided in this paper.

QUESTION 1

(a)   (i)   Describe what is meant by 'sire evaluation'.

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    (ii) What is the aim of central-test sire evaluation?

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  (iii) What is the importance of link sires in sire evaluation?

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  (iv) 1. In a sire-evaluation scheme, how many progeny per sire are required to achieve medium accuracy of performance?

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       2. Why is it necessary to have a minimum number of progeny for each sire?

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QUESTION 1. (Continued)

      (v)   In a sire-evaluation scheme, what would be the value of having each stud represented by three or four rams, rather than only one ram?

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MEDIUM WOOL: HAY (1989–91), DENILIQUIN (1989–94), MACQUARIE (1990–94), AND YARDSTICK WA (1993–94)
'Merino Superior Sires', Aust. Assn. Stud Merino Breeders, IWS 1995.

Ram No.	Sire-breeding identity	Prog. No. Accuracy	GFW % (dev) 1st	2nd	CFW % (dev) 1st	2nd	FD μm (dev) 1st	2nd	BWT % (dev) 1st	2nd	Tops % (dev) 1st	2nd	Culls % (dev) 1st	2nd	Conf.	Qual.
65	Old Ashrose 61	29 M	1·3	–0·1	1·8	0·9	0·3	0·5	4·4	4·3		–18		+9		– –
66	Old Ashrose Angus	23 M	–1·6	0·9	–1·3	1·0	1·0	1·3	1·0	1·9	–15	–16	+25	+20	–	– –
67	Old Ashrose M111	37 M	1·5	–0·2	1·9	1·0	–0·3	–0·3	3·4	4·7	–4	–1	+6	–1		
68	Old Ashrose PCC 146	22 M	2·8	–1·1	0·6	–3·3	0·5	0·2	6·4	4·3	–9	–4	–4	+13		
69	Old Cobran Big Mac	24 M	1·0	1·7	2·7	3·5	–0·4	–0·1	1·1	0·8	–2	–8	+8	+3		
70	Old Cobran Snowball	37 M	0·7	1·3	2·4	2·3	0·8	1·2	–3·6	–3·3		+5		–6		
71	One Oak 00·400	36 M	1·3	0·8	1·3	1·8	0·4	0·4	0·6	0·1		0		–5		
72	One Oak 009	26 M	–0·0	1·8	1·4	4·3	–0·5	–0·4	0·6	0·5	+5	+14	–4	–18		++
73	One Oak Atlas 438	19 M	2·4	1·7	3·8	3·0	0·0	0·1	1·6	0·5	+24	+21	–26	–6	++	++
74	One Oak G2	42 M	–0·7	–0·6	–0·8	0·2	–0·1	–0·1	–1·8	–2·3	–9	–2	+7	+2		
75	One Oak L4	25 M	3·0		2·9		0·1		–0·3		+11		–8			+
76	One Oak Poll 3	48 M	4·5	7·8	4·3	7·1	0·4	0·4	–1·1	–1·4	+9	+12	–8	–13		++
77	Parakeelya 141	75 H		6·3		2·6		–1·2		2·0	+3	–8	+16	+14	– –	–
78	Pemcaw 0·197	20 M	–1·3		–1·3		–0·2		3·5		+7		–19			++
79	Pemcaw 6·123	194 H	–2·3	–1·7	–1·6	–1·3	–0·2	–0·6	–0·6	–1·5	+6	+13	–5	–8	+	++
80	Pooginook 4·2	35 M	–2·8	–1·0	–2·2	–0·5	0·4	0·4	0·6	1·3		–1		–10		
81	Pooginook 8·11	45 M	–1·7	–2·7	–1·2	–2·3	0·2	0·5	–1·2	–2·2	–10	–10	+20	+19		– –
82	Rambouillet 2529	28 M	–5·5	–8·4	–6·3	–8·8	0·8	0·9	11·8	12·2	–5	–8	+11	+19	++	– –
83	Rolvenden 416	26 M		–2·2		–1·8		0·4		–1·6		–18		–9		– –
84	Roselea Poll Patriot	31 M	1·0		1·5		–0·3		2·7		+4		–12			
85	Roseville Park 0·938	49 M	–0·3	–2·1	0·9	0·2	–0·6	0·8	–1·1	–1·6	+7	+18	–20	–31		++
86	Roseville Park 0133	77 H	–2·3	–2·5	–3·3	–3·9	–1·1	–1·6	–4·3	–4·2	0	+16	–4	–13	–	++
87	Roseville Park 1232	48 M	1·8	0·3	1·0	0·4	–0·6	–0·6	–0·3	1·1	+4	+32	–13	–17	+	++
88	Roseville Park 3253	58 H	4·8	6·2	4·2	6·5	–0·6	–0·5	–3·3	–3·6	+4	+12	+4	+2		++
89	Roseville Park 44	37 M	0·6		0·6		–1·1		–3·7		+18		–13			++
90	Roseville Park 7470	25 M	–0·1	–5·0	–3·1	–7·6	–0·6	–0·7	1·2	–0·4	–11	+8	+2	–9		
91	Roseville Park 912	46 M	–4·0	–4·4	–4·8	–5·5	–0·1	0·2	–3·3	–3·6	–22	–11	+34	+26		– –
92	Strathcluan W305	140 H	–1·3	–4·1	–2·3	–4·9	–0·0	–0·4	1·2	2·0	–6	–4	+1	+2		–
93	Sunny Valley 7	39 M		–0·7		–6·5		0·7		0·1		–10		–1		– –
94	Sunset 555	54 M	3·2	3·0	1·5	1·8	0·6	0·8	1·3	2·3	+4	+19	–10	–11		
95	Sunset 9·14	35 M	5·0	1·6	3·4	0·4	0·8	0·9	–0·5	–2·2	+28	+10	–20	–16	++	++
96	The Grange 03014	15 M	5·1	4·3	1·4	0·8	–0·2	0·0	1·7	0·1	+5	–8	0	+7	+	– –

QUESTION 1. (Continued)

(b)   Study the table on page 4 to assist you in answering the following questions.

(i)   Define the following terms:

GFW ………………………………………………………………………………

CFW………………………………………………………………………………

FD ………………………………………………………………………………

BWT………………………………………………………………………………

(ii)   What do the shaded areas within columns indicate?

………………………………………………………………………………

(iii)   On the basis of objectively measured wool production, which are the top TWO rams?

1.   ………………………………………………………………………………

2.   ………………………………………………………………………………

(iv)   On the basis of subjective sheep classing, which are the top TWO rams?

1.   ………………………………………………………………………………

2.   ………………………………………………………………………………

(v)   Although the production figures for ram number 79 and ram number 80 are similar, why would a wool producer have more confidence in the results for ram number 79?

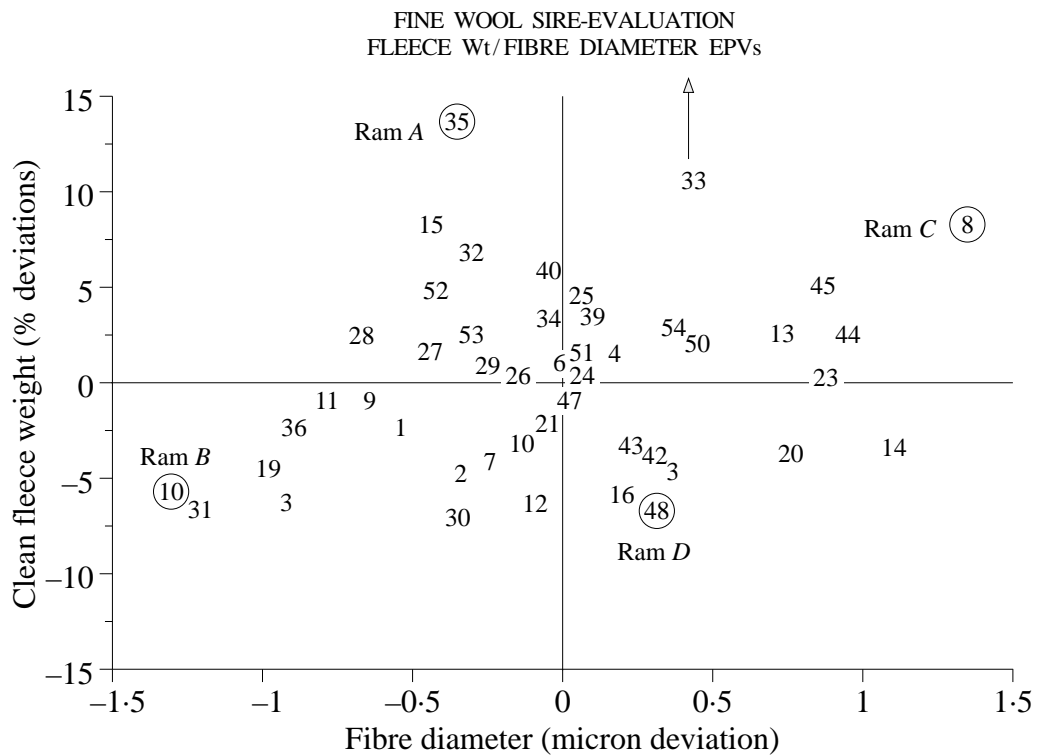………………………………………………………………………………

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………………………………………………………………………………

(vi)   Taking into account the two years of results, what would be the expected improvement in body weight of the progeny of ram 82?

………………………………………………………………………………

QUESTION 1. (Continued)

(c)   (i)

<div align="center">FINE WOOL SIRE-EVALUATION
FLEECE Wt / FIBRE DIAMETER EPVs</div>

'Merino Superior Sires', Aust. Assn. Stud Merino Breeders, IWS 1994

Using the above chart, describe the fleece characteristics of:

Ram *A* (35) ………………………………………………………………………………

……………………………………………………………………………………………

Ram *B* (10) ………………………………………………………………………………

……………………………………………………………………………………………

Ram *C* (8) ………………………………………………………………………………

……………………………………………………………………………………………

Ram *D* (48) ………………………………………………………………………………

……………………………………………………………………………………………

QUESTION 1. (Continued)

(ii) What is the difference between estimated progeny values and true progeny values?

………………………………………………………………………………………

………………………………………………………………………………………

………………………………………………………………………………………

………………………………………………………………………………………

(iii) The relationship between estimated and true progeny values is affected by heritability of the trait. Explain.

………………………………………………………………………………………

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QUESTION 2

(a) (i) The classing of sheep within a sire-evaluation scheme involves two classers working on different days.

1. Outline the reason for having two classers.

………………………………………………………………………………

………………………………………………………………………………

2. Outline the reason(s) for two separate classing days.

………………………………………………………………………………

………………………………………………………………………………

(ii) Explain the term 'subjective assessment' in terms of sire evaluation.

………………………………………………………………………………

………………………………………………………………………………

(iii) Name FOUR subjectively-assessed conformation traits.

1. ……………………………………………………………………………

2. ……………………………………………………………………………

3. ……………………………………………………………………………

4. ……………………………………………………………………………

QUESTION 2. (Continued)

    (iv)   Name FOUR subjectively-assessed wool quality traits.

        1. …………………………………………………………………………………

        2. …………………………………………………………………………………

        3. …………………………………………………………………………………

        4. …………………………………………………………………………………

    (v)   Name TWO wool traits that can be assessed both objectively and subjectively.

        1. …………………………………………………………………………………

        2. …………………………………………………………………………………

(b)   (i)   Describe the aim of sheep classing.

        …………………………………………………………………………………………

        …………………………………………………………………………………………

    (ii)   Indicate TWO characteristics that classers would look for when assessing sheep for wool quantity.

        1. …………………………………………………………………………………

        2. …………………………………………………………………………………

    (iii)   Indicate the value of good constitution to wool-producing sheep.

        …………………………………………………………………………………………

        …………………………………………………………………………………………

    (iv)   Most sheep are classed at about eighteen months of age. Indicate reason(s) for this.

        …………………………………………………………………………………………

        …………………………………………………………………………………………

    (v)   What is meant by 'two-stage classing'?

        …………………………………………………………………………………………

        …………………………………………………………………………………………

QUESTION 2. (Continued)

(c)   Use the selected sire-evaluation information in the table below to answer the following question.

SUPERFINE SIRE EVALUATION

| Sire identity | GFW % (dev) | CFW % (dev) | FD μm (dev) | FDCV % (dev) | BWT % (dev) | FEC EBV | Classer grade | | | |
							Top %	Culls %	Conf.	Qual.
9601	–2·0	–0·6	–2·0	6·5	–5·9	0·2	–10	25	+	++
9602	–4·5	–6·2	1·0	–4·5	–6·6	0·1	–25	30		++
9603	1·5	1·8	0·9	–1·2	3·2	0·0	5	–8	+	+
9604	–1·9	–0·2	–2·5	–6·5	4·0	0·4	20	–26	++	+
9605	3·6	4·8	2·0	3·5	1·6	–0·2	24	–30		+
9606	–2·5	–1·5	–2·0	–4·5	3·2	–0·5	10	–10	+	++
Flock average	3·0	2·2	18·5	20·2	35					

Select the TWO most appropriate sires for an extra-superfine 16·0 μm wool producer. Indicate the advantage(s) and disadvantage(s) of each of the selected sires.

(i)   Sire …………………………………………………………………………………………

Advantage(s) …………………………………………………………………………………

………………………………………………………………………………………………

Disadvantage(s) ………………………………………………………………………………

………………………………………………………………………………………………

(ii)   Sire …………………………………………………………………………………………

Advantage(s) …………………………………………………………………………………

………………………………………………………………………………………………

Disadvantage(s) ………………………………………………………………………………

………………………………………………………………………………………………

SECTION II

(50 Marks)

Attempt ALL questions.

Each question is worth 10 marks.

In each question, parts (a), (b), and (c) are of equal value.

Answer the questions in the spaces provided in this paper.

QUESTION 3

(a) Study the following table and use it as an aid in answering parts (i), (ii), (iii), (iv), and (v) below.

STRUCTURE OF TWO TYPICAL PROPERTIES

		A	B
Area (ha)		20 000	30 000
Sheep		11 000	7 000
Breeding ewes (%)		42	38
Lamb marking (%)		65	60
Mortality (%)		8·5	5·5
Cattle		100	100
Total D.S.E.		14 000	9 000
Wool	• greasy (kg/head)	4·5	6·0
	• clean (kg/head)	2·9	3·6
	• micron (μm)	21–23	23–24
Income ($)	• wool	126 000	85 000
	• sheep sales	12 000	18 000
	• cattle	6 000	6 000

'Wool production guide', Elders 1993

(i) Name the wool-growing region of NSW where properties A and B might be located.

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QUESTION 3. (Continued)

(ii)   Name and explain TWO listed characteristics that help identify the region.

1.   ……………………………………………………………………………………

……………………………………………………………………………………

……………………………………………………………………………………

2.   ……………………………………………………………………………………

……………………………………………………………………………………

……………………………………………………………………………………

(iii)   Indicate THREE factors that may have led to the lamb-marking percentages of 65% and 60%?

1.   ……………………………………………………………………………………

2.   ……………………………………………………………………………………

3.   ……………………………………………………………………………………

(iv)   Indicate the TWO main factors that result in property *A* making $41 000 more from the sale of wool than property *B*?

1.   ……………………………………………………………………………………

2.   ……………………………………………………………………………………

(v)   Calculate the overall stocking rate of each property (show working).

……………………………………………………………………………………

……………………………………………………………………………………

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QUESTION 3. (Continued)

(b)   Complete the sheep-breed characteristics in the table below.

SHEEP-BREED CHARACTERISTICS

Breed	Border Leicester	Corriedale	Merino
Physical appearance			Soft, white open face with pink skin, no black wool fibres, no kemp fibres
Mature body weight (kg)	Rams 90 to 115 Ewes 55 to 79		
Fibre diameter (microns (μm))		Average 28 Range 25 to 32	Average 21 Range 16 to 24·5
Greasy fleece weight (kg)	Average 6·0 Range 5·5 to 6·5		
Staple length (mm)	Average 160 Range 120 to 230		Average 85 Range 60 to 110
Fertility		Lambing percentages of 100% and more can be expected, with individual flocks producing more than 130% lambs	

'Australian woolclassing', John Fowler, Macmillan education Australia, 1996

(c)   (i)   What are the chemical building blocks of proteins called?

………………………………………………………………………………………

(ii)   Circle the correct alternative A, B, C, or D.

Digestion in the rumen DOES NOT mainly occur as a result of

(A)   enzymatic activity.

(B)   acidic activity.

(C)   microbial activity.

(D)   mechanical action.

QUESTION 3. (Continued)

(iii) Indicate (✓) which TWO of the following attributes are most likely to DECLINE markedly when a plant flowers/matures.

(A) Mineral content   …………

(B) Crude protein percentage   …………

(C) Fibre content   …………

(D) Organic matter digestibility   …………

(E) Lignin content   …………

(iv) The following feedstuffs were tested for metabolisable energy. They received values of 6, 8, 9, and 12 MJME/kg DM. Indicate in the table which value should apply to each feedstuff.

Feedstuff	MJME/kg DM
Wheat grain	
Natural pasture hay	
Lucerne hay	
Wheat straw	

(v) When grazing a paddock of improved pasture at three sheep per hectare, Merino sheep each produce 5 kg of greasy wool per year. For each increase in stocking rate of one sheep per hectare, the average fleece production declines by 0·5 kg per sheep per year.

1. Complete the following table.

Stocking rate (sheep/ha)	3	4	5	6	7	8	9	10
Wool shorn per sheep (kg)	5	4·5						
Wool per hectare (kg)	15							

2. Which stocking rate would you choose to achieve optimum productivity from this paddock?

………………………………………………………………………………

QUESTION 4

(a)   (i)   Describe the 'ram effect'.

          ………………………………………………………………………………………

          ………………………………………………………………………………………

    (ii) Describe the main function of oxytocin in the ewe.

          ………………………………………………………………………………………

          ………………………………………………………………………………………

    (iii) List TWO advantages of ultrasounding ewes before lambing.

          1. ………………………………………………………………………………

          2. ………………………………………………………………………………

    (iv) Describe the most important function(s) of shelter-belts in increasing the survival rate of new-born lambs.

          ………………………………………………………………………………………

          ………………………………………………………………………………………

    (v) Outline THREE possible strategies that can be employed before or during joining, to overcome shorter oestrous periods in maiden ewes.

          1. ………………………………………………………………………………

          2. ………………………………………………………………………………

          3. ………………………………………………………………………………

(b)   (i)   List FOUR sheep breeds commonly used as terminal sires in the Australian prime-lamb industry.

          1. ………………………………………………………………………………

          2. ………………………………………………………………………………

          3. ………………………………………………………………………………

          4. ………………………………………………………………………………

QUESTION 4. (Continued)

    (ii)   Outline FOUR desirable characteristics of prime-lamb dams to produce elite lamb.

        1. …………………………………………………………………………………

        2. …………………………………………………………………………………

        3. …………………………………………………………………………………

        4. …………………………………………………………………………………

   (iii)   Identify TWO quality traits of meat that could be adversely affected by selling lambs through sale-yards.

        1. …………………………………………………………………………………

        2. …………………………………………………………………………………

   (iv)   Describe where the following types of fat would be found in the carcass of a 40 kg sheep.

        1. Abdominal fat…………………………………………………………………

         …………………………………………………………………………………

        2. Subcutaneous fat …………………………………………………………………

         …………………………………………………………………………………

        3. Marbling fat ……………………………………………………………………

         …………………………………………………………………………………

    (v)   A 50 kg Border Leicester–Merino ewe losing 5 kg weight in drought conditions would draw on its body components in an order. Indicate the order in the table below.

        First   Last

QUESTION 4. (Continued)

(c)   (i)   If the heritability of clean fleece weight is 0·4 and the heritability of ewe fertility is 0·2, which trait would respond most readily to selection within a breeding flock? Explain why.

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…………………………………………………………………………………………

…………………………………………………………………………………………

(ii)   Define 'independent culling levels'.

…………………………………………………………………………………………

…………………………………………………………………………………………

(iii)   Describe the term 'selection index'.

…………………………………………………………………………………………

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…………………………………………………………………………………………

(iv)   Explain the term 'heterosis'.

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…………………………………………………………………………………………

(v)   What is the difference between phenotypic and genetic correlations?

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QUESTION 5

(a)　　(i)　Describe TWO factors that can lead to drench resistance in a flock.

1.　……………………………………………………………………………………

……………………………………………………………………………………

2.　……………………………………………………………………………………

……………………………………………………………………………………

Study the table and use it as an aid in answering parts (ii), (iii), and (iv).

RESULTS OF FAECAL EGG COUNT TRIALS, 1987, 1990, AND 1993

	YEAR		
	1987	*1990*	*1993*
No. of trials	33	285	132
BZ resistance—% of farms	80	94	98
LEV resistance—% of farms	64	87	85
Dual resistance—% of farms	–	26	12
Multiple resistance—% of farms	–	58	73

Dr Brown Besier/Dr John Plant. Australian Farm journal - Wool, Rural Press, May 1995

(ii)　To which drench was there an increase in resistance between 1990 and 1993?

………………………………………………………………………………………

(iii)　What is meant by 'dual resistance'?

………………………………………………………………………………………

………………………………………………………………………………………

(iv)　What is meant by 'multiple resistance'?

………………………………………………………………………………………

………………………………………………………………………………………

(v)　Describe the difference between 'worm resistance' and 'drench resistance'.

………………………………………………………………………………………

………………………………………………………………………………………

………………………………………………………………………………………

QUESTION 5. (Continued)

(b)   Study the information below and answer parts (i), (ii), and (iii).

PRICE GRID			
	FAT SCORE		
Lamb carcass weight range (kg)	*2*	*3*	*4*
18·1–20·0	0·20	0·40	–0·80
20·1–22·0	0·40	0·60	–0·60
22·1–24·0	0·60	0·80	–0·20
24·1–26·0	0·40	0·60	–0·60
≥26·1	0·20	0·40	–0·80

(i)   Fill in the following table by calculating the premiums/discounts, totals, and average price.

Lamb carcass weight (kg)	*Fat score*	*Base price* ($)	*Premium / discount*	*Total price per carcass* ($)
24·6	3	2·00		
18·3	2	2·00		
22·0	3	2·00		
26·7	2	2·00		
20·8	4	2·00		
Average price per carcass $				

(ii)   Calculate the gross margin, using the average price from part (i). Assume a variable cost of $15·00 per head.

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(iii) Calculate the break-even lamb carcass weight per head (kg).

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QUESTION 5. (Continued)

(c)   (i)   Name and describe FIVE unique properties of wool that make it valuable as a textile fibre.

1.   …………………………………………………………………………………

…………………………………………………………………………………

2.   …………………………………………………………………………………

…………………………………………………………………………………

3.   …………………………………………………………………………………

…………………………………………………………………………………

4.   …………………………………………………………………………………

…………………………………………………………………………………

5.   …………………………………………………………………………………

…………………………………………………………………………………

(ii)   List TWO natural fibres that compete with wool in the apparel market.

1.   …………………………………………………………………………………

2.   …………………………………………………………………………………

(iii)   List TWO synthetic fibres that compete with wool in the apparel market.

1.   …………………………………………………………………………………

2.   …………………………………………………………………………………

(iv)   Name a synthetic fibre often used in blends with wool to make fabrics for fashion clothing.

…………………………………………………………………………………

QUESTION 6

(a)   (i)   Examine Figures 1 and 2, and use them as an aid to answer parts 1 and 2.
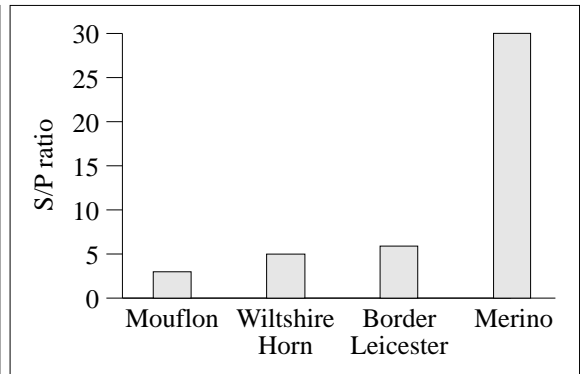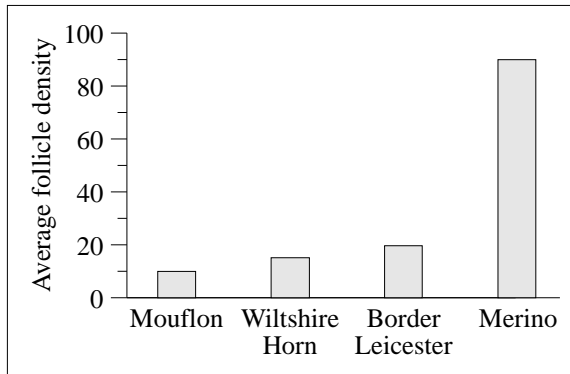

FIG. 1. FOLLICLE DENSITY FOR
DIFFERENT BREEDS

FIG. 2. S/P RATIO FOR
DIFFERENT BREEDS

Courtesy Dr Elizabeth McCloghry.

    1.   What is the S/P ratio for Border Leicester sheep?

………………………………………………………………………………………

    2.   Which breed of sheep has the greatest follicle density?

………………………………………………………………………………………

  (ii)   Name THREE types of wool fibres present in the sheep's fleece.

    1. ………………………………………………………………………………

    2. ………………………………………………………………………………

    3. ………………………………………………………………………………

  (iii)   Which follicle type is most prevalent in fine-wool Merino sheep?

………………………………………………………………………………………

  (iv)   What are the critical stages in a sheep's life with regard to follicle development?

………………………………………………………………………………………

………………………………………………………………………………………

  (v)   What management strategies should be applied to maximise follicle development?

………………………………………………………………………………………

………………………………………………………………………………………

………………………………………………………………………………………

………………………………………………………………………………………

QUESTION 6. (Continued)

(a)   (i)

NSW WOOL PRICE TRENDS
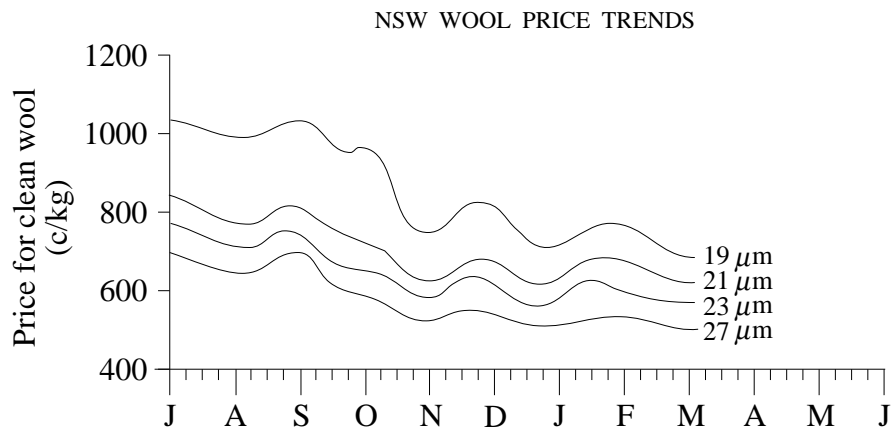
The Land Newspaper, 29 February 1996. Reproduced with permission.

1. Use the graph to estimate the approximate price difference between the 19 μm and 23 μm wool in July.

……………………………………………………………………………………

……………………………………………………………………………………

2. Use the graph to estimate the price of each of these wools in January.

Fibre diameter (μm)	Estimated price (c/kg)
19	
21	
23	

3. Calculate the sale price of each of these fleeces in January. (Show all your working.)

Fleece	Fibre diameter (μm)	Fleece characteristics	Working	Sale price ($)
A	19	3 kg clean		
B	21	4·8 kg clean		
C	23	7·8 kg greasy (yield 72·0%)		

(ii) List TWO major forms of contamination in a sale lot of wool.

1. ……………………………………………………………………………

2. ……………………………………………………………………………

Question 6 continues on page 22

QUESTION 6. (Continued)

(c) (i) Indicate the relative importance of the following raw wool characteristics to a wool processor. (Indicate High, Medium, or Low.)

1. Coefficient of variation of fibre diameter ……………

2. Yield ……………

3. Style ……………

4. Length ……………

5. Fibre diameter ……………

6. Age ……………

(ii) Describe the method of obtaining and preparing staples from a wool bale for testing on an ATLAS machine.

…………………………………………………………………………………

…………………………………………………………………………………

…………………………………………………………………………………

…………………………………………………………………………………

(iii) Name TWO yields published in wool-sale catalogues.

1. …………………………………………………………………………

2. …………………………………………………………………………

(iv) Define the term 'regain'.

…………………………………………………………………………………

…………………………………………………………………………………

…………………………………………………………………………………

QUESTION 7

(a)   (i)   List FOUR cast-fleece wools commonly found in a Merino clip.

           1. ……………………………………………………………………………………

           2. ……………………………………………………………………………………

           3. ……………………………………………………………………………………
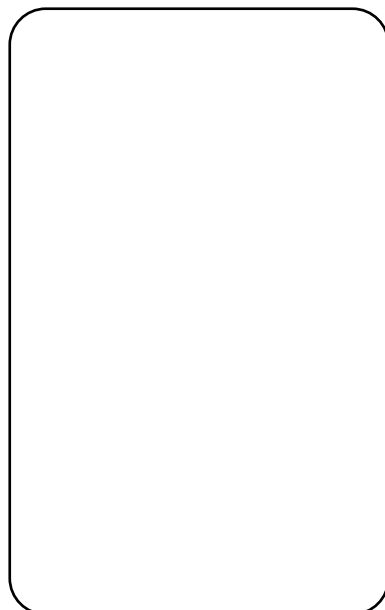
           4. ……………………………………………………………………………………

    (ii) Outline FOUR characteristics that are recorded about the wool from each mob when preparing the classer's report.

           1. ……………………………………………………………………………………

           2. ……………………………………………………………………………………

           3. ……………………………………………………………………………………

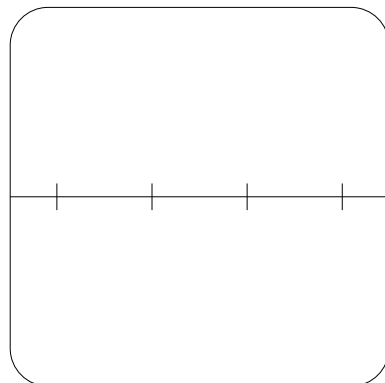   4. ……………………………………………………………………………………

    (iii) Using the following information, brand the Bale Face and Bale Head as set out in the Code of Practice.

- Property Name: Yarraglen
- Broker: Elders
- Bale Number: 7
- Description: AAAM
- Classer's Stencil: 97558753

BALE FACE   BALE HEAD

QUESTION 7

(b)   (i)   Name THREE major wool-selling centres in NSW as at May 1996.

        1. ……………………………………………………………………………

        2. ……………………………………………………………………………

        3. ……………………………………………………………………………

    (ii) Name the type of wool commonly sold by traditional selling.

        ……………………………………………………………………………

    (iii) Describe sale of wool by tender.

        ……………………………………………………………………………

        ……………………………………………………………………………

        ……………………………………………………………………………

    (iv) The market reporting of wool has changed recently. Identify FOUR mandatory prime characteristics used with AWEX—ID.

        1. ……………………………………………………………………………

        2. ……………………………………………………………………………

        3. ……………………………………………………………………………

        4. ……………………………………………………………………………

QUESTION 7. (Continued)

(c)   (i)   Use the following table to answer the question below.

OP AND SP RESIDUE IN 369 GREASY-WOOL SALE LOTS TESTED DURING THE
1994–95 SEASON (UP TO AND INCLUDING FEBRUARY 1995)

Concentration (mg/kg)	Organophosphates (% sale lots)	Synthetic pyrethroids (% sale lots)
<1·0	63·7	74·3
1·0–9·9	26·0	19·0
10·0–24·9	8·2	3·0
25·0–49·9	1·6	1·1
50·0–74·9	0·5	–
≥75·0	–	2·7

Given that OP and SP pesticide residues in excess of 10 milligrams per kilogram are undesirable, calculate the percentage of sale lots in excess of the desirable level for each pesticide.

1. OP ……………………………………………………………………………………

……………………………………………………………………………………

2. SP ……………………………………………………………………………………

……………………………………………………………………………………

(ii)   Outline TWO strategies to reduce chemical residues in greasy wool.

1. ……………………………………………………………………………………

……………………………………………………………………………………

2. ……………………………………………………………………………………

……………………………………………………………………………………

(iii)   Explain the carbonising process.

……………………………………………………………………………………

……………………………………………………………………………………

……………………………………………………………………………………

QUESTION 7. (Continued)

    (iv)   List SIX processes used in worsted yarn manufacture.

        1. …………………………………………………………………………

        2. …………………………………………………………………………

        3. …………………………………………………………………………

        4. …………………………………………………………………………

        5. …………………………………………………………………………

        6. …………………………………………………………………………

SECTION III

ESSAYS ON SHEEP HUSBANDRY AND WOOL TECHNOLOGY

(30 Marks)

Suggested time: 30 minutes per essay.

Write TWO essays, choosing ONE from Question 8 and ONE from Question 9.

Both questions are of equal value.

Answer each question in a *separate* Writing Booklet.

Headings, diagrams, graphs, tables, etc. may be included in your essays.

QUESTION 8

EITHER

(a)   There are many options open to prime-lamb producers for marketing their product. Describe the advantages and disadvantages of each of five options.

OR

(b)   Choose FIVE diseases from the following list, and outline the cause, symptoms, life cycle (if applicable), prevention, and treatment of each.

- Tetanus
- Flystrike
- Pregnancy toxaemia
- Selenium deficiency
- Lice
- Brucellosis
- Barber's Pole worm

QUESTION 9

EITHER

(a)   Discuss ways in which wool growers, wool classers, and shed staff can minimise contamination of the wool-clip at various stages of the production process.

OR

(b)   The following measurements may be obtained from each sale lot of wool: vegetable matter, fibre diameter, staple strength, grease content, and coefficient of variation of length. Describe the processes involved in obtaining each of these measurements.

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