



B O A R D O F S T U D I E S
N E W S O U T H W A L E S

1999 HSC
Rural Technology
Notes from the Examination Centre

© Board of Studies NSW 2000

Published by
Board of Studies NSW
GPO Box 5300
Sydney NSW 2001
Australia

Tel: (02) 9367 8111

Fax: (02) 9262 6270

Internet: <http://www.boardofstudies.nsw.edu.au>

March 2000

Schools, colleges or tertiary institutions may reproduce this document, either in part or full, for bona fide study purposes within the school or college.

ISBN 0 7313 4499 5

200026

Contents

Section I – Farm Machinery (20 marks)	4
Section II – Farm Structures (10 marks).....	4
Section III – Farm Graphics (20 marks)	5
Section IV – Related Materials Science (10 marks)	5
Section V – Farm Water Supplies (15 marks).....	6
Section VI –Topical Study (10 marks)	6
Regional Project: Farm Study (15 marks)	7

1999 HIGHER SCHOOL CERTIFICATE RURAL TECHNOLOGY NOTES FROM THE EXAMINATION CENTRE

2 Unit

This year 22 candidates sat for the examination from 5 centres. In 1998, however, there were over 70 candidates.

Section I – Farm Machinery (20 marks)

General Comments

This question was answered well by most candidates.

Question 1 (a) – (p)

- (a) All answers fell into the required range.
- (b) This part was well answered by most candidates.
A good range of responses was submitted by the majority of candidates and most parts were well answered.
- (e) A good range of responses were submitted here for tractor safety.
- (f) Most candidates understood that the machine would or could roll, but very few mentioned the raising of the centre of gravity.
- (i) This was poorly answered. A small percentage calculated the correct numbers but failed to identify the correct units.
- (j) About 50% of candidates misunderstood the question and gave an incorrect response here.
- (k) Safety with regard to hydraulics was poorly understood by most candidates.
- (l) The concept of centre of gravity causing overturning was poorly understood by half the candidates.
- (m) This part was well answered by all candidates.
- (n) The graph was well read by all candidates.
- (o) About half the candidates gave the correct response here.
- (p) All candidates answered this question well.

Section II – Farm Structures (10 marks)

General Comments

This section was well done by the majority of candidates.

Specific Comments

Question 2

- (a) This part was understood by many candidates.
- (b) A number of candidates failed to understand this part.
- (g)(h)(i) Almost all candidates answered these parts correctly.

Section III – Farm Graphics (20 marks)

The drawing skills in this section were generally poor. Line work and neatness were of a low standard.

Candidates are reminded that sharp pencils and accuracy are an important factor.

Question 3

No candidate scored well in this question.

- (a) Most candidates had problems in drawing the nut and thread; the majority did not section properly, while none revolved the flange bolt hole.
- (b) Most candidates attempted to complete the materials list given.

Question 4

Only a small number of candidates realised that it was a conical development, and only a few transferred the true lengths of the sizes.

Question 5

About half the candidates made a reasonable attempt at this isometric drawing. Many, however, viewed the 'offset link', as indicated by the arrow, the wrong way around.

Section IV – Related Materials Science (10 marks)

Question 6

- (a) The majority of candidates did not answer this part well.
 - (i) The best candidates answered this well.
 - (ii) Very few candidates answered this part correctly. Kilojoules and watts were very confusing for many.
- (b) - (c) These parts were answered well by approximately half the candidates.
- (d) Most candidates understood the question and answered correctly.
- (e) This very specific question was very poorly answered; no candidate succeeded in answering it fully since they had great difficulty in applying the formulae correctly.
- (f) Answers here were good; some candidates, however, failed to relate their answers to the fact that the specific material could be machined.

The table on forces and failure was well answered by the majority of candidates, although some had difficulties in relating the type of force to the specific material failure on a farm.
- (g) Most candidates had difficulty in naming a third type of fungus.
- (h) Few candidates could classify defects in timber into two distinct groups.

- (j) Most candidates had some knowledge of defects, but few got sketches of the five defects correct.
- (k) Colour was the main factor (green copper naphthenate) for determining if a piece of timber has been treated with either copper naphthenate or zinc naphthenate. Few candidates had any knowledge of zinc naphthenate.

Section V – Farm Water Supplies (15 marks)

Question 7

- (a) (i) This part was well answered, with most candidates realising that several factors influence algae growth.
- (ii) This was well answered by all candidates.
- (iii) Answers here were also good.
- (b) All responses indicated that candidates had a good understanding of the treatment of various water problems.
- (c) A good wide range of answers was submitted here.
- (d) The characteristics of poly pipe that give it advantages over other pipes were well understood.
- (e) (i) This part was well answered; good graph reading skills were apparent.
- (ii) Answers to this part were good.
- (iii) The question was misread with the new flow rate given as the answer rather than the difference.
- (f) The majority of candidates knew the correct names of the pumps.
- (g) Little knowledge of the purpose of the air chambers shown was displayed by the majority of candidates.
- (h) The term and concept ‘cavitation’ was not understood by the majority of candidates.
- (i) This part was not well answered due to the lack of knowledge of cavitation.

Section VI –Topical Study (10 marks)

Windmills and Solar Power as Farm Power Sources

Question 8

- (a) This question was attempted by all candidates and was usually well answered.
- (b) Only one candidate knew that the instrument shown was an anometer.
- (c) Nearly all candidates answered this correctly.
- (d) Approximately half the candidates understood this question fully and, therefore, answered correctly.
- (e) Very few candidates could explain or sketch the operation of a cylinder pump.
- (f) This part was well answered by the majority of candidates.
- (g) This was a very ambiguous question that was not answered correctly by any candidate.
- (h) Most candidates answered this question satisfactorily.
- (i) This was well answered by the majority of candidates..

- (ii) Some candidates had difficulties in comparing the advantages of solar power with those of conventional power.
- (i) Candidates failed to answer this question fully and did not include all comparisons between diesel-powered and solar-powered pumps.
- (j) This question was generally understood and well answered.
- (k) Although some candidates still answered 'with tilt angles', the question was generally answered well.
- (l) This popular question was well answered by most candidates.
- (m) This was answered correctly by the majority of candidates.
- (n) This part was also answered correctly by most candidates.

Regional Project: Farm Study (15 marks)

The comments are again similar to those of previous years. The number of candidates is smaller than in 1998 and the standard of the reports has declined.

It must be emphasised that this is a farm study. There were, however, candidates who wrote reports on the industry chosen rather than on a particular farm. In writing the report, the candidate should include all items of machinery and equipment used on a specific farm. For the crop section of the report, the pertinent areas are clearly indicated in the Syllabus.

In writing the report on the livestock activity the candidates should consider the question: 'If I were starting a livestock operation on a recently cleared area, what equipment and facilities would I require to purchase or build?' This would apply to all types of livestock operations.

The following points need to be considered by teachers.

- (i) In writing a report on a farm the candidates should have visited the property at least once. During this visit photographs should have been taken. Pictures from pamphlets and photocopies should not be used. It is the specific property that is being reported upon and the report should feature the equipment used on the property.

In using a photograph candidates should decide if it is necessary and whether it benefits the description of an activity or machine.

The clarity of the photographs needs to be considered, as some candidates used photographs which were blurred and taken in bad light.

Too many students draw fences, combine harvesters and shearing handpieces. These can be photographed.
- (ii) Computers were used to produce many reports but were spoilt by untidy, hand-written captions for photographs. It is suggested that guidelines be used for these handwritten captions.
- (iii) A half-page description of the farm visited should precede each section. The description should include the size of the property, soil type, climatic conditions, crops grown and reasons for growing the crop. The livestock activity should have a similar description.
- (iv) The format of the project should be planned before starting and the requirements of the Syllabus must be checked to ensure that all parts will be covered. A small number of candidates are still being disadvantaged because they are devoting too much of the report to the crop or animal type.
- (v) Spelling needs to be checked. As most candidates are using computers to complete the reports it is easy for a spell-check program to be used. Common words spelt incorrectly are; *auger*, *principles*, *diameter*, *meters*, *litres*, and *hydraulics*.
- (vi) Metric measurements should be used.

- (vii) It is important that each project should be proof-read to ensure that all the parts are in the correct order and that photographs relate to the appropriate section of the report.
- (viii) Machinery should be correctly named eg. disc harrow as distinct from disc plough.
- (ix) Drawings of sheds, movement of animals and yards should comply with AS1100 Drawing Standards and be produced using a pencil and drawing equipment. It is inappropriate to include photocopies of promotional drawings produced by a company which builds raised board shearing sheds. These can be redrawn if necessary, as the purpose of the drawing component of the Syllabus is for the candidates to be able to use the AS1100 drawing standards. Circles should be drawn using a compass or a circle gauge.
- (x) If a farm did not engage in primary tillage or fertilizing activity in the period in which the report was being written, the candidates should indicate how it was carried out in the past, or describe an activity that replaces it. Some limited processes rely on spraying applications to destroy weeds.
- (xi) There is no need to draw a fully labelled shearing hand-piece and the drive mechanism. A simple explanation of the operation involved and a simple sketch of the shearing cutters would be more appropriate.

Candidates have approximately 12 months in which to write the report, but some reports looked as though they were completed the night before.

Whilst it is not compulsory and candidates will not be penalized if the report is hand-written, the use of computers should be encouraged. The current thinking in schools is for students to be computer literate and the use of the computer will be preparation for tertiary studies where assignments are required to be typed.