

External assessment 2023

Multiple choice question book

Agricultural Science

Paper 1

General instruction

- Work in this book will not be marked.



Queensland
Government

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Queensland Curriculum
& Assessment Authority

Section 1

Instruction

- Respond to these questions in the question and response book.
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QUESTION 1

A farmer has purchased a neglected overgrown orchard. Which option would be the initial strategy to use in an IPM strategy?

- (A) chemical control of pests and diseases
- (B) biological control using predators
- (C) physical removal of vegetation
- (D) physical traps for insects

QUESTION 2

Identify where most fat digestion occurs in monogastric animals.

- (A) liver
- (B) mouth
- (C) stomach
- (D) small intestine

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QUESTION 3

The table identifies the functions of different plant hormones.

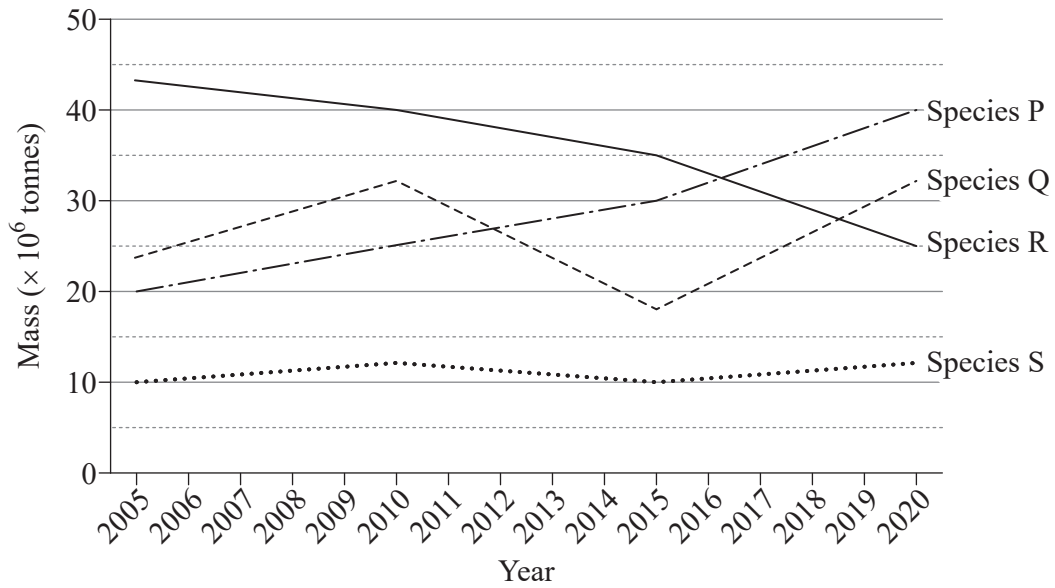
Function	Hormone			
	Auxin	Ethylene	Gibberellin	Absciscic acid
Germination	✗	✗	✓	✗
Growth to maturity	✓	✗	✓	✗
Flowering	✓	✓	✓	✗
Fruit development	✓	✓	✓	✗
Seed dormancy	✗	✗	✗	✓

Identify which hormone contributes primarily to reproductive stage development in plants.

- (A) auxin
- (B) ethylene
- (C) gibberellin
- (D) absciscic acid

QUESTION 4

The graph shows the population data for edible marine species found in a native fishery.



Which species would be most suitable for establishing a sustainable agricultural enterprise?

- (A) Species P
- (B) Species Q
- (C) Species R
- (D) Species S

QUESTION 5

Which ration would best suit the general nutritional requirements of an egg-laying chicken?

Ration	Minimum protein (%)	Minimum calcium (%)	Maximum crude fibre (%)
(A)	19.5	1.0	6.0
(B)	15.5	3.5	10.0
(C)	15.5	1.0	11.5
(D)	15.0	4.0	10.0

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QUESTION 6

Australian horticultural industries were impacted by two free trade agreements that came into effect on 1 January 2019. The table shows data for fresh horticultural exports from Australia to another country under these agreements between 1 January 2018 and 31 December 2020.

Crop	Export (t)		
	2018	2019	2020
Asparagus	62	91	118
Avocados	2510	2601	1575
Cherries	278	320	325
Potatoes	12 391	23 174	20 165

Identify which crop had the best outcome from the agreements.

- (A) asparagus
- (B) avocados
- (C) cherries
- (D) potatoes

QUESTION 7

Which strategy would most effectively reduce turbidity in a creek running through an extensive cattle operation?

- (A) erect stock fences along the creek
- (B) remove aquatic vegetation from the creek
- (C) limit the stocking rate of cattle over the operation
- (D) increase the level of chemical control of weeds along the creek bank

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QUESTION 8

Deformed bones were observed in an animal herd. This condition is most likely caused by a deficiency in

- (A) iron.
- (B) calcium.
- (C) nitrogen.
- (D) phosphorus.

QUESTION 9

The table shows nutrient composition of the feeds available for dairy cattle on a farm.

Feed	Crude protein (g/kg DM)	Metabolisable energy (MJ/kg DM)	Dry matter (%)
Silage	120	9.5	54
Hay	140	9.9	87
Barley	130	11.2	90
Lupin	380	12.9	88
N-fertilised turnip leaf	190	12.5	14

If a ration consisting of 3 kg silage, 5 kg barley and 2 kg N-fertilised turnip leaf was supplied to each animal, what would be the total available crude protein and metabolisable energy?

	Crude protein (g)	Metabolisable energy (MJ)
(A)	1390	120
(B)	1159	91
(C)	998	82
(D)	833	69

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QUESTION 10

The table shows yield and variable costs associated with different methods of cotton production. Income is \$680 per bale for lint and seed.

Which method would provide the highest gross margin per hectare?

Method	Production system	Yield (bales/ha)	Variable costs (\$/ha)
(A)	Irrigated	12.0	3982
(B)	Irrigated	12.0	4088
(C)	Dryland	4.0	1424
(D)	Dryland	3.5	1290

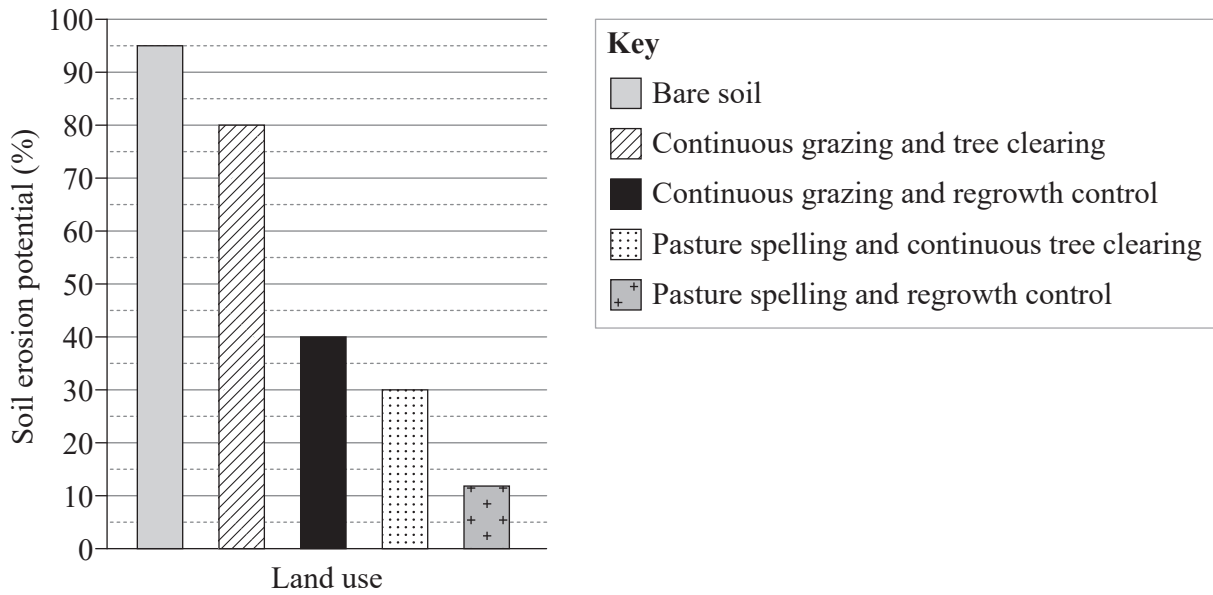
QUESTION 11

Identify which factors affect decisions made about property management.

- (A) food security, market suitability
- (B) location to markets, food quality
- (C) financial considerations, human resources
- (D) environmental factors, population distribution

QUESTION 12

The graph shows the soil erosion potential for different agricultural land uses.



What would be the reduction in the percentage of soil erosion if pastures were spelled with control of regrowth compared to continuous grazing and tree clearing?

- (A) 18%
- (B) 28%
- (C) 68%
- (D) 83%

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QUESTION 13

Two farms implemented different strategies for managing drought.

Farm A	Farm B
Improved nutrition	Built a silo
Retained breeding stock	Sold all steers and culled animals based on age
Implemented supplementary feeding	Used paddock rotation
Monitored ground cover	Maintained appropriate stocking rates

Which steps in the PPRR management model were demonstrated by both farms?

- (A) prevention, response, recovery
- (B) preparedness, response, recovery
- (C) prevention, preparedness, recovery
- (D) prevention, preparedness, response

QUESTION 14

Australian agricultural products are often referred to as 'clean and green' because

- (A) produce is grown through conventional methods and sold directly to consumers.
- (B) sustainable methods are used to produce food with quality assurance programs.
- (C) the food produced is considered safe and farming systems maintain soil health.
- (D) there is limited use of chemicals and genetic breeding is used to control pests.

QUESTION 15

The table shows an excerpt of income and variable costs from a maize enterprise.

	Budget (\$/ha)
Income	
Maize	930
Costs	
Sowing	165
Fertiliser & application	156
Herbicide & application	102
Insecticide & application	25
Harvesting	67
Crop levies and insurance	48

Calculate the gross margin per hectare for the enterprise.

- (A) \$367
- (B) \$415
- (C) \$563
- (D) \$1493

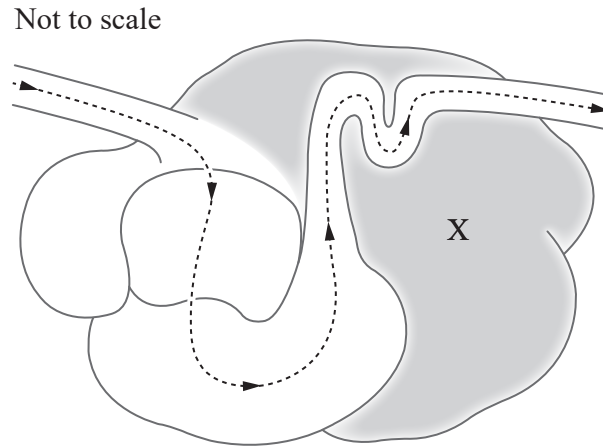
QUESTION 16

Which management strategy would control pests and diseases in an extensive animal industry?

- (A) visual inspections of poultry sheds
- (B) removing animal waste from a cattle feedlot
- (C) selection of short-coated cattle for animal production
- (D) maintenance of pastures in free-range egg production

QUESTION 17

The diagram represents a ruminant stomach.



The main nutritional contribution of the microbes found in X is

- (A) vitamin C synthesis.
- (B) cellulose breakdown to volatile fatty acids.
- (C) increased absorption of potassium and phosphorus.
- (D) methane production from carbohydrate breakdown.

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QUESTION 18

Minimum tillage practices can

- (A) speed up water loss from the soil profile.
- (B) increase the rate of carbon loss from the soil.
- (C) reduce disease and populations of soil-borne pests.
- (D) improve infiltration of water through the soil profile.

QUESTION 19

A cash flow statement for a farm was recorded for a three-month period.

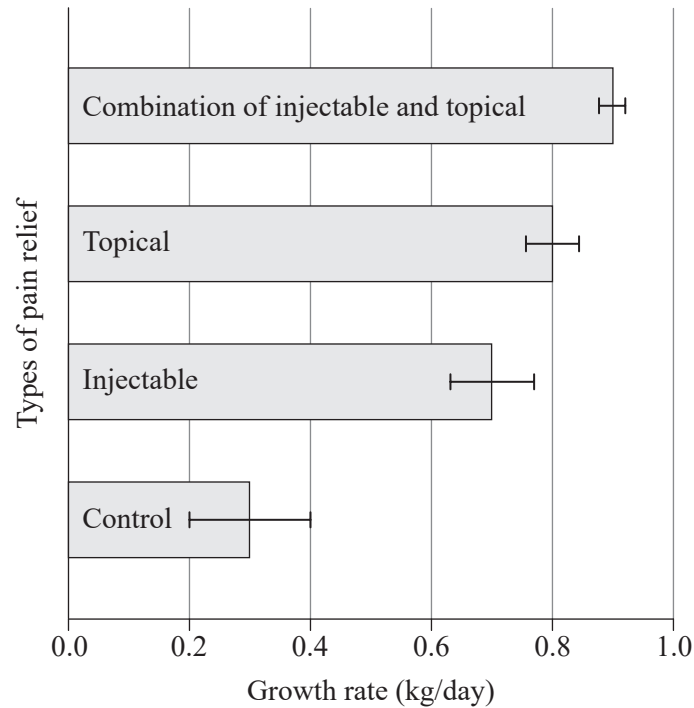
Month	Income (\$)	Costs (\$)	Balance (\$)
July	15 600	8231	
August	3000	4122	
September	13 432	1000	

Calculate the September balance.

- (A) \$1000
- (B) \$6185
- (C) \$13 616
- (D) \$18 679

QUESTION 20

Consumer demand has resulted in the availability of more pain relief strategies for animal husbandry procedures. The graph shows the effect of different types of pain relief on the average growth rate of calves in the first month after castration. The graph includes standard error bars.



Which two types of pain relief show statistically similar mean values for growth rate?

- (A) control and topical
- (B) injectable and topical
- (C) topical and combination of injectable and topical
- (D) injectable and combination of injectable and topical

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References

Question 5

Data sourced from:

Chick Starter formulation from Barastoc, <https://barastocpoultry.com.au/our-products/essentials-range/chick-starter/>

Golden Yolk formulation from Barastoc, <https://barastocpoultry.com.au/our-products/essentials-range/golden-yolk/>

Question 10

Data derived from Revell, G, Welsh, J & Powell, J 2022, 'Australian cotton industry gross margin budgets', *CottonInfo*, www.cottoninfo.com.au/publications/australian-cotton-industry-gross-margin-budgets

Question 17

Adapted from Pearson Scott Foresman 2008, 'Abomasum', *Wikimedia Commons*, [https://commons.wikimedia.org/wiki/File:Abomasum_\(PSF\).png](https://commons.wikimedia.org/wiki/File:Abomasum_(PSF).png)



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