Candidate Name	Centre Number	Candidate Number

ZIMBABWE SCHOOL EXAMINATIONS COUNCIL

General Certificate of Education Advanced Level

AGRICULTURE ENGINEERING 6048/2

PAPER 2 Theory

SPECIMEN PAPER 2 hours 30 minutes

Additional materials:
Answer paper,
Ruler,
Scientific calculator.

TIME 2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page and on any separate answer paper used.

Section A

Answer all questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer any **two** questions on the separate answer paper provided.

Your answers must be in continuous prose, where appropriate.

At the end of the examination, fasten any separate answer paper used securely to the question paper.

All working for numerical answers must be shown.

INFORMATION FOR CANDIDATES

The intended number of marks is given in brackets [ ] at the end of each question or part question.

The quality of your language will be taken into account in the marking of your answers.

FOR EXAMINER'S USE	
SECTION A	
1	
2	
3	
4	
5	
6	
SECTION B	
TOTAL	

This question paper consists of 9 printed pages and 3 blank pages.

For Examiner's Use

SECTION A [60 marks]

1. (a) Explain **three** reasons for cooling the engine.

[3]

(b) Suggest **three** factors affecting the rate of engine cooling.

[3]

(c) Suggest any **four** possible causes of overheating in an engine.

[4

For Examiner's Use

2. **(a)** Outline any **two** reasons for lubricating engines.

_____

_____

_____

_____ [2]

(b) Describe any **one** lubrication system.

_____

_____

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_____

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_____

_____ [4]

(c) **(i)** Describe any **two** advantages of force feed lubrication system.

_____

_____

_____

_____ [2]

(ii) Explain any **two** factors that affect the efficiency of a lubricating system.

_____

_____

_____

_____ [2]

For Examiner's Use

3. **(a)** Describe the operational functions of a planter.

[5]

(b) Outline the routine maintenance of a knapsack sprayer.

[5]

For Examiner's Use

4. **(a)** Explain any **three** aims of the Environmental Impact Assessment (**EIA**) in Zimbabwe.

[3]

(b) Suggest **three** environmental factors managed in green houses.

[3]

(c) Describe the significance of surveying for agricultural projects.

[4]

5. **(a)** Define the term Integrated Water Management (**IWM**).

For Examiner's Use

_____

_____ [1]

(b) Outline the principles of integrated water management which should be considered in water conservation.

_____

_____

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_____

_____

_____

_____ [5]

(c) Explain **four** advantages of using wind power.

_____

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_____

_____ [4]

6. The following cost estimates averaged over a period of **three** years on an existing and new farm tractor.

For Examiner's Use

Overheads	**Existing tractor**	**New tractor**
	$	**$**
Depreciation	485	742
Interest	342	644
Insurance	45	59
Road licence	74	74
Total each year	**946**	**1519**
Running costs	**$**	**$**
Fuel and lubricants	0.69	0.62
Repairs and maintenance	1.24	0.56
Labour	1.55	1.55
Total each year	**3.48**	**2.73**

(a) **(i)** Carry out a break even analysis to determine the suitable point to replace the existing tractor.

[3]

(ii) Define the following terms:

overhead,

_____

_____ [1]

running costs.

_____

_____ [1]

For Examiner's Use

(b) Outline any **five** maintenance routine practices which ensure economic use of the farm tractors.

_____

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_____ [5]

SECTION B

7. **(a)** Discuss the benefits of farm mechanisation to Zimbabwe. [10]

(b) Discuss the possible limitations of farm mechanisation and suggest steps which can be taken to ensure the success of the mechanisation programmes. [10]

[**Total:20]**

8. **(a)** Discuss the problems of excessive heating of an engine. [6]

(b) Describe the air and water cooling systems of engines considering their merits and demerits. [14]

[Total: 20]

9. **(a)** Discuss significance of computerizing an irrigation system on a farm [15]

(b) Suggest other areas on the farm where the farmer can use computer applications to his benefit. [5]

[**Total: 20]**

10. **(a)** Complete a cashflow budget for six months ending **31 December 2017**, for a company starting with a balance in hand of **$3 990.**
Credit transactions are as follows

	Purchases	**Sales**
	$	**$**
July	9 800	18 600
September	9 300	20 000
October	9 000	20 700
November	12 800	21 300
December	14 600	27 900

Monthly salaries and wages add up **to $8 000.**
Other monthly cash expenses are estimated as **$2 100** to the end of September and **$2 700** afterwards.
A dividend of **$5 300** is due in August and a capital investment in a new machine of **$5 600** is planned for December. [10]

(b) Describe advantages of cash flow planning. [10]

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