

2425/104  
AGRICULTURAL ENGINEERING I  
Oct./Nov. 2010  
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AGRICULTURE

MODULE I

AGRICULTURAL ENGINEERING I

3 hours

**INSTRUCTIONS TO CANDIDATES**

*You should have the following for this examination:*

*Answer booklet;*

*Drawing instruments;*

*Non-programmable calculator.*

*This paper consists of THREE sections A, B and C.*

*Answer FIVE questions in ALL choosing at least ONE question from each section.*

*Maximum marks for each part of a question are as shown.*

**This paper consists of 3 printed pages.**

**Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.**

## SECTION A

Answer at least **ONE** question from this section.

1. (a) Explain the following terms with reference to files:  
 (i) cut;  
 (ii) pinning. (4 marks)
- (b) Outline any **four** care and maintenance practices observed when using files. (6 marks)
- (c) With the aid of diagrams, describe the following filing techniques:  
 (i) cross filing;  
 (ii) draw filing. (10 marks)
2. (a) With the aid of diagrams, describe the **three** types of oxy-acetylene flames. (9 marks)
- (b) With the aid of diagrams, explain the following oxy-acetylene welding techniques:  
 (i) leftward;  
 (ii) rightward. (11 marks)

## SECTION B

Answer at least **ONE** question from this section

3. (a) Explain the following types of tractor power:  
 (i) draw bar;  
 (ii) brake. (4 marks)
- (b) Explain any **four** factors that determine the power output of draft animals. (6 marks)
- (c) Describe the following sources of power, stating any **two** advantages of each:  
 (i) wind;  
 (ii) solar. (10 marks)
4. (a) State any **four** advantages of a four-stroke cycle engine in comparison to a two-stroke type. (4 marks)
- (b) With the aid of diagrams, explain the operation of a two-stroke spark ignition engine. (16 marks)
5. (a) Outline any **three** possible causes of tractor engine lubricating oil deterioration. (9 marks)
- (b) With the aid of a diagram, explain the operation of a splash type engine lubrication system. (11 marks)

## SECTION C

Answer at least **ONE** question from this section.

6. (a) Explain **two** methods of varying the application rate of a spinning disc fertilizer distributor. (4 marks)
- (b) With the aid of a diagram, explain the operation of an oscillating spout fertilizer distributor. (16 marks)
7. (a) State any **three** combine harvester crop losses. (3 marks)
- (b) With the aid of a diagram, explain the operation of a combine harvester. (17 marks)
8. (a) Outline any **three** factors that determine the output of a hammer mill. (6 marks)
- (b) With the aid of a diagram, explain the operation of a hammer mill. (14 marks)

