

2425/104
AGRICULTURAL ENGINEERING I
June/July 2016
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

**DIPLOMA IN AGRICULTURE
MODULE I**

AGRICULTURAL ENGINEERING I

3 hours

INSTRUCTIONS TO CANDIDATES

*This paper consists of **THREE** sections; A, B and C.
Answer a total of **FIVE** questions choosing at least **ONE** question from each section in the answer booklet provided.
All questions carry equal marks.
Maximum marks for each part of a question are indicated.
Candidates should answer the questions in English.*

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) Outline the procedure of dressing a minor human body skin cut. (6 marks)
- (b) For each of the following classes of fires; A, B, D and E, state the burning material and the colour coding for its extinguisher. (4 marks)
- (c) Draw the following workshop tools and state one use for each: (10 marks)
- (i) dividers;
- (ii) inside calliper;
- (iii) odd leg calliper;
- (iv) try square;
- (v) centre punch.
2. (a) State any four safety precautions to be observed when using an electric arc welding equipment. (4 marks)
- (b) Describe the process of oxy-acetylene gas welding. (6 marks)
- (c) Illustrate the following types of weld joints: (10 marks)
- (i) square butt joint;
- (ii) lap joint;
- (iii) single barrel joint;
- (iv) stud joint;
- (v) fillet joint.

SECTION B

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

3. (a) Describe the following sources of farm power: (6 marks)
- (i) geothermal;
- (ii) wind;
- (iii) solar.
- (b) Using a diagram, explain the operation of an overhead valve operating mechanism of an engine. (14 marks)



4. (a) Explain the following as applies to engine oils:
- (i) viscosity;
 - (ii) detergency;
 - (iii) multigrade. (6 marks)
- (b) Using a diagram, explain the operation of a gear type oil pump. (14 marks)
5. (a) Explain any **four** methods of increasing wheel traction of a tractor. (6 marks)
- (b) Using a diagram, explain the operation of a tractor differential unit. (14 marks)

SECTION C

Answer at least ONE question from this section.

6. (a) Outline the procedure of hitching a fully mounted plough to a tractor. (10 marks)
- (b) Explain the function of the following plough parts:
- (i) share; *cuts soil horizontally*
 - (ii) frog; *guide*
 - (iii) coulter.
- (6 marks)
- (c) State any **four** maintenance requirements of a mouldboard plough. (4 marks)
7. (a) Draw a cross-sectional side view of a pick-up baler. The drawing should show the position of ram, packers, shear plate, needles and bale chamber tensioner. (10 marks)
- (b) Explain the operation of the pick-up baler drawn above. (10 marks)
8. (a) Give any **four** requirements of a good fertilizer distributor. *Combined with large particles* (4 marks)
- (b) Using a diagram, explain the operation of a spinning disc fertilizer distributor. (12 marks)
- (c) Outline any **two** methods of varying the application rate of a spinning disc fertilizer distributor. *forward speed of distributor. disc speed* (4 marks)

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