2425/204
AGRICULTURAL ENGINEERING II
June/July 2018
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN AGRICULTURE

MODULE II

AGRICULTURAL ENGINEERING II

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
 Answer booklet;
 Non-programmable scientific calculator;
 Drawing instruments;
 Psychrometric chart.
*This paper consists of **THREE** sections; A, B and C.*
*Answer **FIVE** questions taking at least **TWO** questions from section A, at least **ONE** question from section B and at least **ONE** question from section C.*
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 4 printed pages.

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

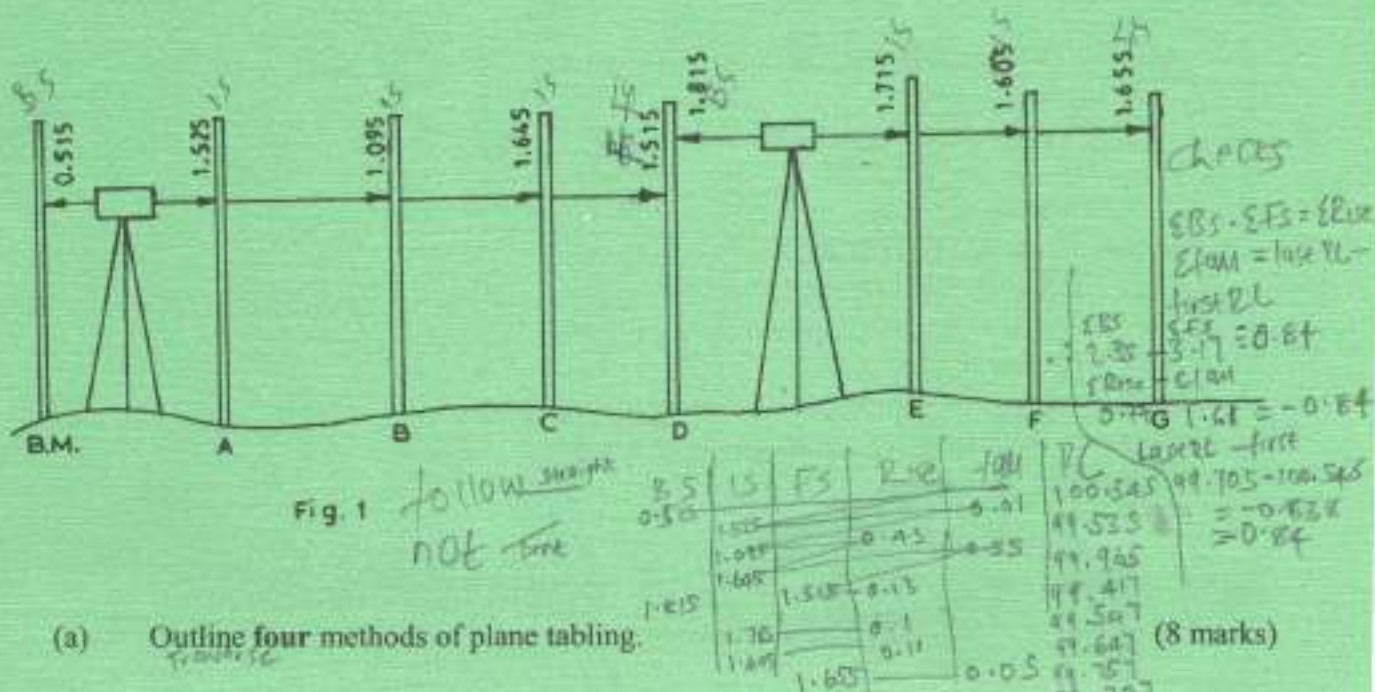**Turn over**

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SECTION A

*Answer at least **TWO** questions from this section.*

1. (a) Outline any **five** methods of determining field elevations. (15 marks)

   (b) State any **five** applications of contours. (5 marks)

2. (a) Explain any **five** methods of measuring horizontal distances. (10 marks)

   (b) Outline any **five** systematic errors in linear measurements. (10 marks)

3. Figure 1 illustrates a set up of surveying instruments in the field during a levelling exercise. The staff readings are as indicated and the staffs are at 30 m interval. Given that the reduced level of the first station i.e. bench mark (B.M) is 100.545 m:

   (a) using the rise and fall method, book the readings in the field book;

   (b) compute the reduced levels of the remaining stations;

   (c) check the entries. (20 marks)

Fig. 1

4. (a) Outline **four** methods of plane tabling. (8 marks)

   (b) Discuss the reasons why a farmer would prefer using plane tabling for producing a farm plan. (12 marks)

SECTION B

Answer at least ONE question from this section.

5.   (a)   Illustrate a suitable site for a fish pond that utilizes a stream water.   (8 marks)

    (b)   Discuss the desirable features of a good crop storage structure.   (12 marks)

6.   (a)   Explain the functions of the ingredients used in concrete making.   (8 marks)

    (b)   Describe the procedure for making a simple concrete slab.   (12 marks)

SECTION C

Answer at least ONE question from this section.

7.   (a)   Give any **four** grain parameters that affect its drying rate.   (4 marks)

    (b)   Discuss the characteristics of natural drying method for grains.   (16 marks)

8.   (a)   Define the following moist air properties:

      (i)   vapour pressure;

      (ii)   relative humidity;

      (iii)   humidity ratio;

      (iv)   enthalpy;

      (v)   specific volume.   (5 marks)

    (b)   Using the psychrometric chart provided, determine the following thermodynamic properties of moist air at 85°F dry-bulb, 70°F wet-bulb and 760 mm Hg:

      (i)   humidity ratio;

      (ii)   relative humidity;

      (iii)   dew point temperature;

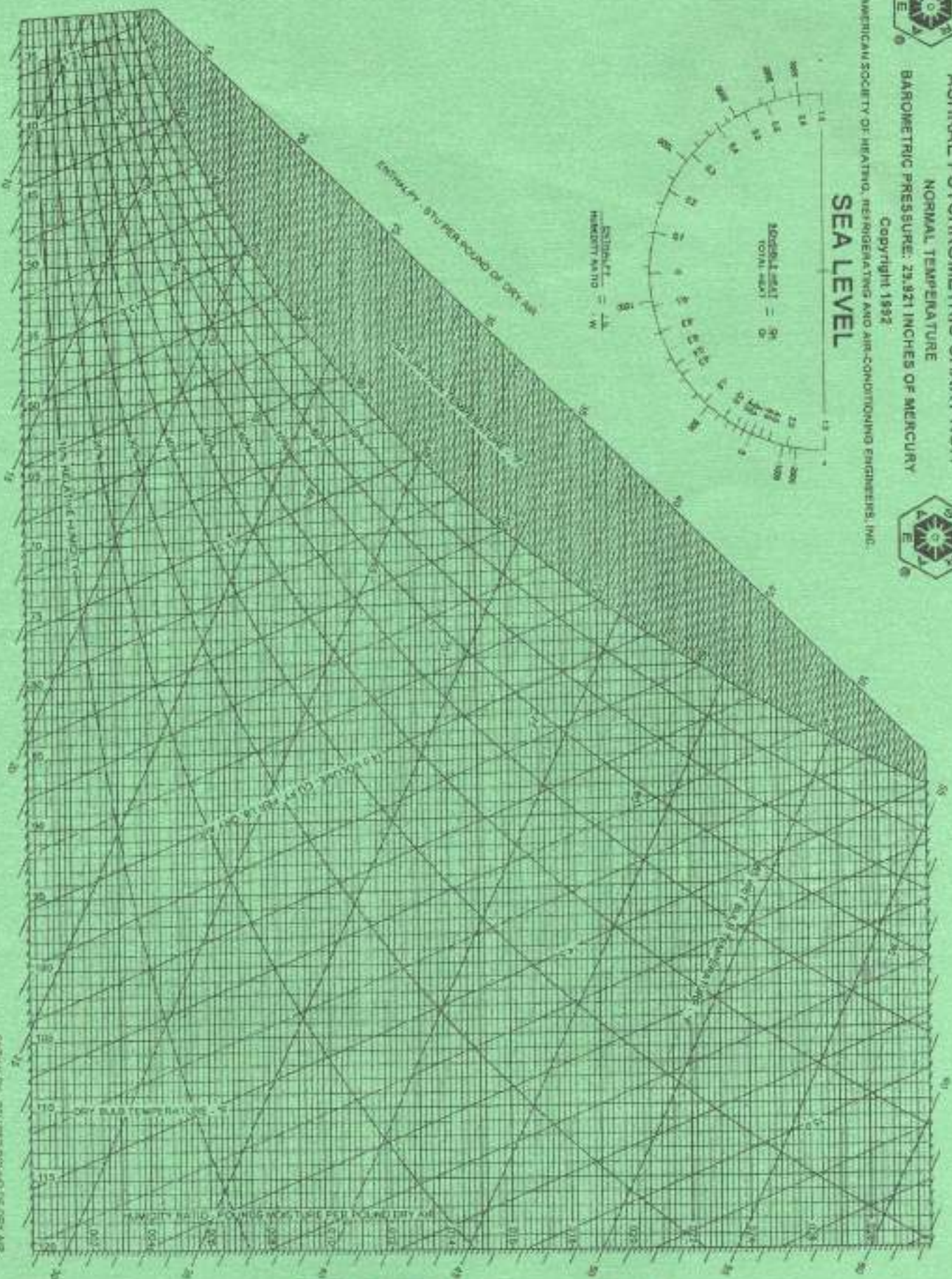   (iv)   enthalpy;

      (v)   specific volume.   (15 marks)

ASHRAE PSYCHROMETRIC CHART NO. 1

NORMAL TEMPERATURE

BAROMETRIC PRESSURE: 29.921 INCHES OF MERCURY

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SEA LEVEL

THIS IS THE LAST PRINTED PAGE.