MACHAKOS UNIVERSITY

University Examination 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

FIRST YEAR SEMESTER TWO EXAMINATION FOR

DIPLOMA IN MECHANICAL ENGINEERING

SURVEYING 1 AND WORKSHOP TECHNOLOGY 1

DATE: **TIME:**

INSTRUCTIONS:

You should have the following for this examination.

-calculator

-drawing instruments

-Answer booklet.

This paper consists of eight questions in TWO sections A and B.

Answer FIVE questions choosing TWO from section A, TWO questions from section B and ONE question from either section.

All questions carry equal marks

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

Candidates should answer the questions in English.

Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.
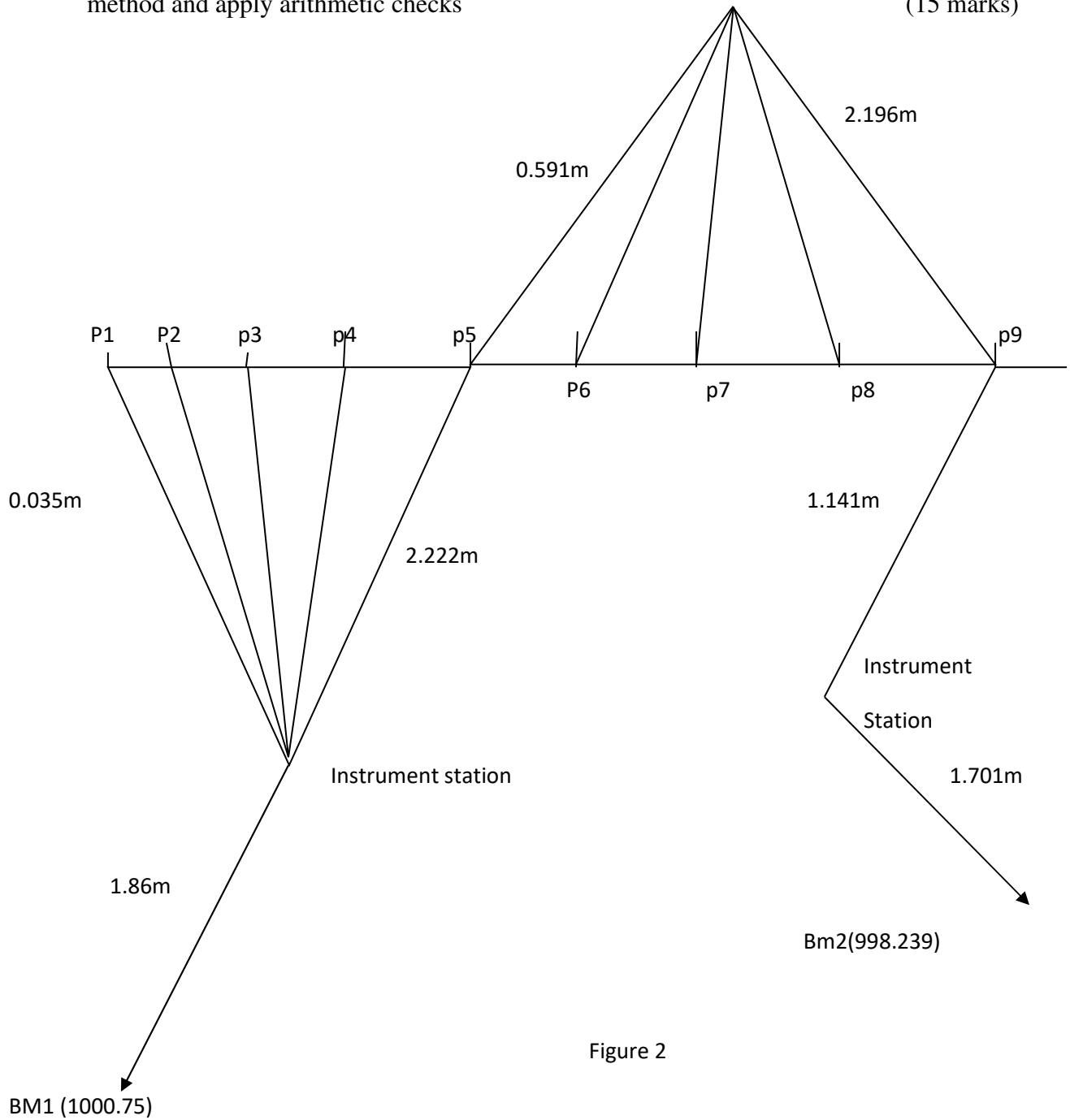
SECTION A (SURVEYING 1)

Answer at least TWO questions from this section.

1. a)   Distinguish between plan surveying and geodetic surveying.   (5 marks)

    b)   Describe FIVE types of surveying in common use.   (15 marks)

2. a)   Define the term "raging" as used in chain surveying.   (1 mark)

    b)   Outline the raging process when chaining a line.   (6 marks)

    c)   Explain THREE classes of errors encountered in chain surveying one example in

          each case.   (6 marks)

    d)   Fig 1 below shows the layout of chain links used in the survey of a site. If the

          30m chain used was later found to be two links longer, calculate the accurate area
          enclosed by the chain line in hectares (one link is equal to 0.3m)

A

198.70m   207.72m

B   235.72m   C
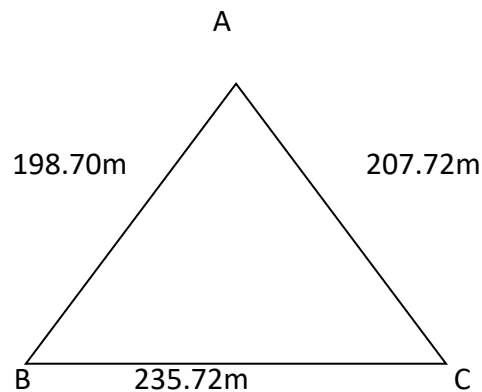
3. a)   Define the following terms as used in leveling (5 marks)

          i)   Line of collimation
          ii) Foresight
          iii) Reduced level
          iv) Vertical line
          v)   Staff station

b) fig 2 shows level readings from BM 1 along a proposed road centre line through P1, P2, P3,…P9 closing at BM 2. Book readings in a std. format and reduce them by rise and fall method and apply arithmetic checks (15 marks)

2.196m

0.591m

P1 P2 p3 p4 p5 p9

P6 p7 p8

0.035m 1.141m

2.222m

Instrument
Station

Instrument station 1.701m

1.86m

Bm2(998.239)

Figure 2

BM1 (1000.75)

4.   a)   List the THREE steps involved in temporary adjustment of a leveling machine.

   b)   Fig 3 shows a piece of land to be used in constructing a community dispensary.
         The reduced levels of intersection points are as shown. Using a scale of 1:500,
         interpolate the contours at intervals of 0.5m

A   C

                                                                        993.127
F   D

                                                                        993.106
                                                                           I

     G   992.473   H   992.228