



Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

MINE SURVEYOR'S CERTIFICATE OF COMPETENCY EXAMINATION

SURVEY I

DATE: 08 OCTOBER 2014

TOTAL MARKS: 100

TO PASS: 50

TIME ALLOWED: 3 HOURS

(08h30 to 11h30)

NOTE:

- This question paper consists of **FOUR** pages including cover page.
- All questions must be answered.
- All answers and sketches to be presented in a neat and decipherable manner.
- Papers will not be marked if not decipherable.
- Restrict the use of highlighters.
- Do not use a red pen.
- Read the instructions on the front page of your answer book carefully.
- No cellular phones shall be allowed in the examination venue.
- The use of computers, laptops and palmtops is prohibited.
- All steps and CHECKS must be done.
- The make and model number of your calculator must be written on the front cover of your answer book

In joining two points, we calculate the distance and direction between them. With the aid of a sketch in the Lo System (zero direction South), state the seven important points to note.

Question 1

[10]

Question 2

State the uses of the following instruments.

- a) Transit theodolite (2)
- b) Sextant (2)
- c) Gyro (1)
- d) Spirit level (1)
- e) Stereometer (2)
- f) Optical square (1)
- g) Pantograph (1)

[10]

Question 3

- a) Name two methods mainly used in levelling calculations. (2)
- b) Mention five notable points to consider when applying methods in (a) (7)

[9]

Question 4

A building site is to be excavated on a hill sloping at 10 degrees to the horizontal. If the horizontal base of the site is to be 40m by 40m and the sides of the excavation are to slope at 1,5m vertical to 1,5m horizontal, calculate the volume of earth to be excavated.

[16]

Question 5

Briefly describe the temporary adjustments of the theodolite under the following topics:

- a) Levelling (3)
- b) Centering (2)
- c) Parallax (2)
- d) Focussing (2)

How often are these adjustments done to the theodolite?

(1)

Mention five permanent adjustments of the theodolite.

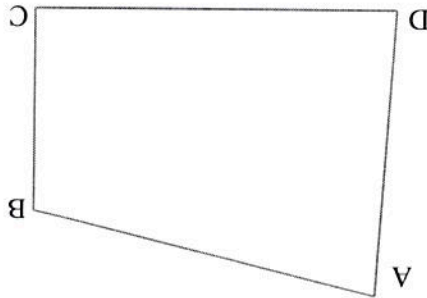
(5)

How often are these adjustments done?

(1)

[16]

Question 6



The results of a survey of area ABCD in which a sludge disposal dam is situated are recorded as follows:

Direction AC = $329^{\circ}58'37''$

distance AC = 192,396m

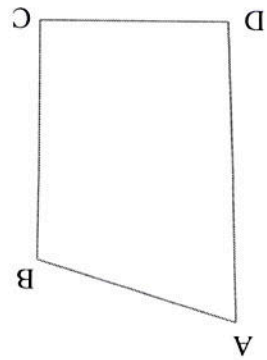
Direction BD = $80^{\circ}22'45''$

distance BD = 174,323m

Calculate area ABCD.

[16]

Question 7



The following information is given in figure ABCD:

$$\text{Angle ABC} = 120^{\circ}35'00''$$

$$\text{Angle BCD} = 85^{\circ}20'05''$$

$$\text{Angle CDA} = 100^{\circ}15'00''$$

$$\text{Side BC} = 152,400\text{m}$$

$$\text{Area ABCD} = 16\,187,440\text{m}^2$$

Calculate the lengths of sides AB, CD and DA.

[23]

TOTAL [100]