

073105T4LAS

LAND SURVEY LEVEL 5

LSM/OS/LM/CR/01/5

Conduct Topographical Survey

November/December 2025



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION
COUNCIL (TVET CDACC)**

WRITTEN

Time: 3 HOURS

INSTRUCTIONS TO CANDIDATE

1. Marks for each question are indicated in the brackets.
2. The paper consists of **TWO** sections: **A** and **B**.
3. Attempt **ALL** the questions in section A and any **THREE** questions in section B.
4. Candidates are provided with a separate answer booklet
5. **DO NOT** write on this question paper.

This paper consists of THREE (3) printed pages.

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

SECTION A (40 MARKS)

Answer ALL the questions in this section.

1. Map making is the final step for producing a topographical map. A complete topographical map should entail all the map elements. List FOUR map elements.
(4 Marks)
2. The type of monument and technique used in survey determines the type of control point established. List THREE types of monuments. (3 Marks)
3. Surveying and levelling operate on different principles. Differentiate between surveying and levelling. (4 Marks)
4. Control points can be categorized as horizontal and vertical. State FOUR purposes of establishing vertical control points. (4 Marks)
5. Map projection is any mathematical transformation of the earth's 3dimensional surface to a 2-dimensional surface. With reference to map projection, differentiate between geoid and ellipsoid. (4 Marks)
6. Reconnaissance is the preliminary stage of any survey work. Highlight FOUR purposes of carrying out reconnaissance. (4 Marks)
7. Topographical survey can be carried out using various instruments. State FIVE instruments used in topographical surveys. (5 Marks)
8. In surveying, bearings are used to describe the direction of a survey line with respect to a reference meridian. Convert the following Whole Circle Bearing to reduced bearings
(4 Marks)
 - a) 45°
 - b) 150°
 - c) 200°
 - d) 310°
9. Measurements taken in survey can be either linear or angular. Outline FIVE methods of linear measurements. (5 Marks)
10. Terrain representation is key in the interpretation of a topographical map. Highlight THREE purposes of the terrain information. (3 Marks)

SECTION B (60 MARKS)

Answer THREE questions in this section.

11.

a) There are various methods of classifying map projections.

i) Outline TWO classifications based on developable surface. (4 Marks)

ii) Explain TWO factors that influence the choice of projection. (4 Marks)

b) Map distortions resulting from projection are inversely proportional to the map scale.

Outline the characteristics of Universal Transverse Mercator projection. (12 Marks)

12.

a) Horizontal control is the establishment of all planimetric positions. Explain FIVE methods used to provide horizontal controls. (10 Marks)

b) There are various methods of survey that are used to produce a topographical map.

Highlight FIVE methods used for carrying out topographical survey. (10 Marks)

13. A contour line is an imaginary line connecting points on the earth's surface that have the same elevation

a) Outline FOUR methods applied for contour lines. (8 Marks)

b) Explain SIX characteristics of contour lines. (12 Marks)

14.

a) Monumenting of the survey control points is a critical step when carrying out any survey work. Highlight FIVE factors to consider when choosing a survey mark.

(10 Marks)

b) A coordinate system is used to determine the position of any point relative to an

origin. Outline the TWO types of coordinate systems. (10 Marks)