ZIMBABWE

MINISTRY OF HIGHER AND TERTIARY EDUCATION, INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT

HIGHER EDUCATION EXAMINATIONS COUNCIL (HEXCO)

NATIONAL DIPLOMA

IN

CIVIL ENGINEERING, URBAN AND REGIONAL PLANNING, SURVEYING AND GEOMATIC

SUBJECT: Engineering Survey **PAPER NO: 573/15/S07**

DURATION: 3 Hours

MARCH/APRIL 2025 EXAMINATION

REQUIREMENTS

1. Answer booklet
2. Scientific calculator

INSTRUCTIONS TO CANDIDATE

1. Answer any four (4) questions.
2. Each question carries 25 marks.

This paper consists of 3 printed pages.

PAPER NO: 573/15/S07 - ENGINEERING SURVEY

QUESTION 1

a) Briefly describe the factors to be considered when planning for a deformation survey of a dam. (5 marks)

b) Explain the characteristic of a mass haul diagram. (5 marks)

c) Discuss the three (3) ways of checking vertically of a storey building. (9 marks)

d) In general, what occurrences do you expect to archive when carrying out deformation survey using triangulation traversing and precise levelling. (6 marks)

QUESTION 2

a) Define the following terms.
Frequency; wavelength; Period; verbally. (1 mark)

b) Explain the following methods used by EDM to measure distance Pulse method and Phase difference method. (10 marks)

c) State eight precautions to be taken when standardizing an EDM. (8 marks)

QUESTION 3

a) Zenith angles where observed from station 'R' to 3 tng beacons. Given the following field data and relevant data. Calculate the Rl of 'R' . (25 marks)

Data

Height of Instrument $= 1.6m$

Redius of earth $= 636100m$

Average Length of Area $1.550km$

Coefficient of refraction 0.12

@R to	*Zenth angles*	*Target height*	*Rlto Tng*	*Msl Distnace*
T_1	88.06.32	0.0	1521.70	2346.5
T_2	88.06.58	0.92	1493.43	2480.6
T_3	88.50.28	0.92	1503.30	3782.8

b) Outflow any five (5) characteristics of a Deformation Survey. (5 marks)

QUESTION 5

a) What is hydrographic survey? (2 marks)

b) List the factors affecting the determination of MSL. (2 marks)

c) Briefly describe the gead. (2 marks)

d) Briefly describe how the MSL is determined. (1 mark)

e) Explain the importance of performing hydrograph surveying. (8 marks)

..../km

Question 4

a) 2 straights with a deflection angle of 13° 16' 25" are formed by a circular curve of radius 600m. If the through chainage of the point of intersection is 27 + 45,72 and pegs are to be placed after every 25m, Prepare necessary setting out data for the curve. Use the deflection angles method (20 marks)