



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY

Department of BUILDING & Civil engineering

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN CIVIL ENGINEERING

DCE 2308: SURVEYING IV

END OF SEMESTER EXAMINATION

SERIES: APRIL 2025

TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **five** questions.

Attempt any **THREE** questions.

Do not write on the question paper.

QUESTION ONE (20 Marks)

- a) State the aims of preparing longitudinal sections with regard to pipeline excavation control. (4 Marks)
- b) With the aid of sketch, outline the procedure of measuring the length of a proposed bridge. (8 Marks)
- c) Fig 1 shows the centerline of a proposed bridge, where the pier point 'P1' is to be set out by theodolite intersection from two points 'P' and 'Q'. Calculate angles θ and β to be set out at 'P' and Q respectively in order to define point 'P1'. (8 Marks)

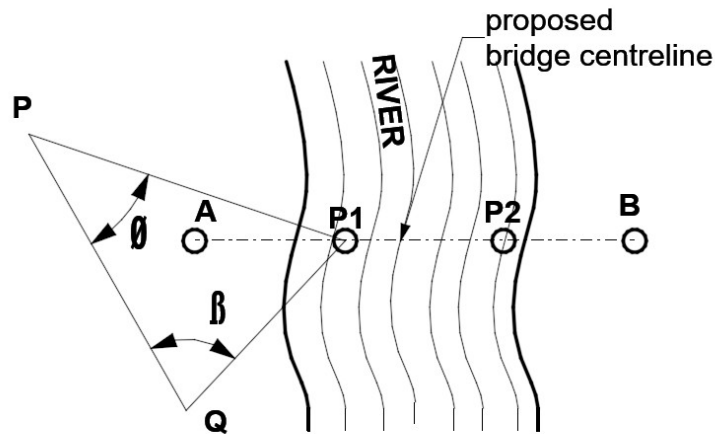


Fig 1

QUESTION TWO (20 Marks)

- a) i) Define the term setting out.
 ii) Differential between the following pair of terms:
- horizontal control and works control
 - record plan and working plan (7 Marks)
- b) A play ground is to be excavated to a uniform formation level of 40.50m above mean sea level (AMSL). A level was set out at 'P' and a reading of 1.974m observed on a BM of 40.206m AMSL:
- i) Calculate the required staff reading for fixing pegs to define the uniform formation level.
 - ii) With the aid of a labeled sketch, explain the procedure of setting out the pegs to define the uniform formation level. (13 Marks)

QUESTION THREE (20 marks)

- a) With the aid of a sketch, outline the procedure of laying pipes, using travellers, after completing excavations. (9 Marks)
- b) Describe the vertical sighting method of verticality control of tall buildings. (11 Marks)

QUESTION FOUR (20 Marks)

- a) Differentiate between a map and a photograph. (4 Marks)

- b) State any FOUR uses of photographs in civil engineering. (8 Marks)
- c) With the aid of a labeled sketch, describe the plumb bob method of verticality control of tall structures, stating its limitations. (8 Marks)

QUESTION FIVE (20 Marks)

A storm water drain at P is to be extended to Q and R on a falling gradient of 1: 120 on plan distances of 37.84m and 64.560m respectively.

The following observations were obtained from a levelling exercise for controlling excavation:

- Level reading of staff on BM on wall of RL 89.52m = 0.493m
- Level reading of staff of top of peg at P = 0.262m
- Level reading of staff of top of peg at Q = 0.451m
- Level reading of staff of invert of existing sewer at P = 2.840m.

Calculate:

- (a) The difference in level between the top of sight rails P-Q, Q-R and P-R.
- (b) The heights of the sight rails at P, Q and R
- (c) The staff reading necessary for fixing the tops of the sight rails, given that a 3.5m traveller is available. (20 Marks)