



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

CERTIFICATE TECHNICIAN I

EBC 1105: CHAIN SURVEYING

END OF SEMESTER EXAMINATION

SERIES: AUGUST/SEPTEMBER 2011

TIME: 3 HOURS

Instructions to Candidates:

You should have the following for this examination

- Answer booklet
- Scientific calculator

This paper consists of **FIVE** questions

Answer **THREE** questions only

Question **ONE** is compulsory

Maximum marks for each question are as shown

This paper consists of **THREE** printed pages

Question 1

- a) Name the principle of chain surveying (1 mark)
- b) Give any **TWO** disadvantages of working with ill-conditioned triangles (2 marks)
- c) Differentiate between the following terms:
(i) Base line and check line
(ii) Chainage and offset
(iii) Main station and tie station
(iv) Cumulative errors and compensating errors (8 marks)
- d) With the aid of a diagram, outline the procedure of chaining around an obstacle by the random line method (6 marks)
- e) A tape of nominal length 50m was found to be 50.23m long. A house of 40m x 30m is to be laid out using the tape. Determine:
(i) The measurement that must be made using this tape to lay out the house
(ii) The measurement of the diagonals (6 marks)
- f) Outline the step chaining procedure (7 marks)

Question 2

- a) Define:
(i) Chaining
(ii) Offsetting
(iii) Random line
(iv) Check measurement (4 marks)
- b) A surveyor has to proceed with measurements across a wide river. Explain how he can overcome this obstacle by use of the congruent triangles method (10 marks)
- c) Explain the working principle of an optical square (6 marks)

Question 3

- a) State any **THREE** categories of obstacles in chain surveying (3 marks)
- b) Chaining has to be done across a cliff between stations A and B on opposite sides of the cliff. If A and B are not intervisible but visible from intermediate stations. Outline the procedure for ranging intermediate point between A and B (7 marks)
- c) Illustrate by neat line diagrams **THREE** ways of setting out perpendicular offsets to a chain line by use of tape and ranging rods only (10 marks)

Question 4

- a) Outline the procedure for carrying out a chain survey exercise (12 marks)
- b) State the factors a surveyor should consider when choosing chain stations on the site (5 marks)
- c) State the precautions a surveyor should take when booking chain survey data (3 marks)

Question 5

- a) Define GPS device (2 marks)
- b) Briefly explain how a GPS device can be used to carry out a surveying exercise (5 marks)
- c) Give **FIVE** advantages of carrying out a surveying exercise by use of a GPS over a chain (5 marks)
- d) Explain how one can use a cross-staff to set out perpendicular and oblique offsets (8 marks)