



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE &  
TECHNOLOGY UNIVERSITY EXAMINATIONS 2012/2013**

**2<sup>ND</sup> YEAR 2<sup>ND</sup> SEMESTER EXAMINATION IN DIPLOMA  
BUILDING AND CIVIL ENGINEERING**

**(KISUMU L. CENTRE)**

**COURSE CODE: TBC 2222**

**COURSE TITLE: ENGINEERING SURVEYING II**

**DATE: 13 /8/13**

**TIME: 9.00 – 10.30 AM**

**DURATION: 1.30 HOURS**

**INSTRUCTIONS TO CANDIDATES**

**This paper consists of 5 questions.**

**Answer question ONE and any other two questions.**

**QUESTION ONE (MARKS 30)**

- i. Define the following (MARKS 9)
  - a) Levelling survey
  - b) Traverse survey
  - c) Setting out survey
- ii. What do you understand by the following as used in engineering surveying (MARKS 12)
  - a) Datum
  - b) Bench Mark
  - c) Survey Station
  - d) Survey line
- iii. List any three areas where you can apply levelling survey in your profession (MARKS 3)
- iv. The table below shows field measurements of four angles of a traverse. Using the table, calculate the values of the angles (MARKS 6)

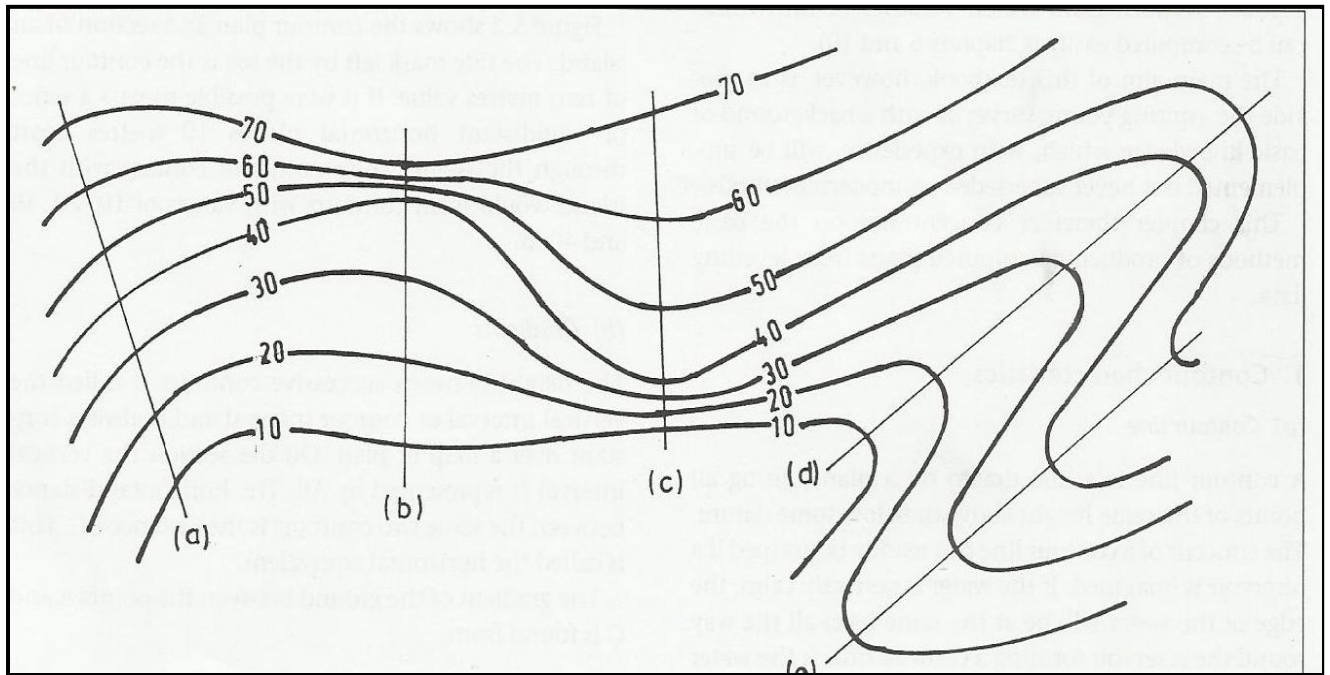
Observation station	Target station	Face left reading	Face right reading	Accepted mean angle
B	A	89° 16' 20"	269° 16' 20"	
	C	185° 18' 40"	05° 19' 00"	
C	B	185° 39' 40"	05° 39' 20"	
	D	271° 38' 20'	91° 38' 40"	
D	C	275° 18' 00"	95° 18' 20"	
	A	01° 02' 20"	181° 02' 40"	
A	D	00° 00' 00"	180° 00' 00"	
	B	92° 15' 30"	272° 15' 30"	

**QUESTION TWO (MARKS 20)**

- i. Outline the procedure for carrying out spirit levelling (MARKS 14)
- ii. In a practical exercise to map contours using a direct method, one of the contours to be mapped was 1150.875 m asl. The bench mark in the vicinity of the site had an elevation of 1150. 501 m asl. A levelling instrument was set near the area where the contour was expected to pass. A reading taken on the benchmark after the instrument was levelled was 1.650m. Assuming the pegs to trace the contour on the ground are to be spaced roughly 15m, explain how the position of the first three pegs can be located starting from the nearest boundary (MARKS 6)

### QUESTION THREE (MARKS 20)

The figure below shows a set of contours in a site plan

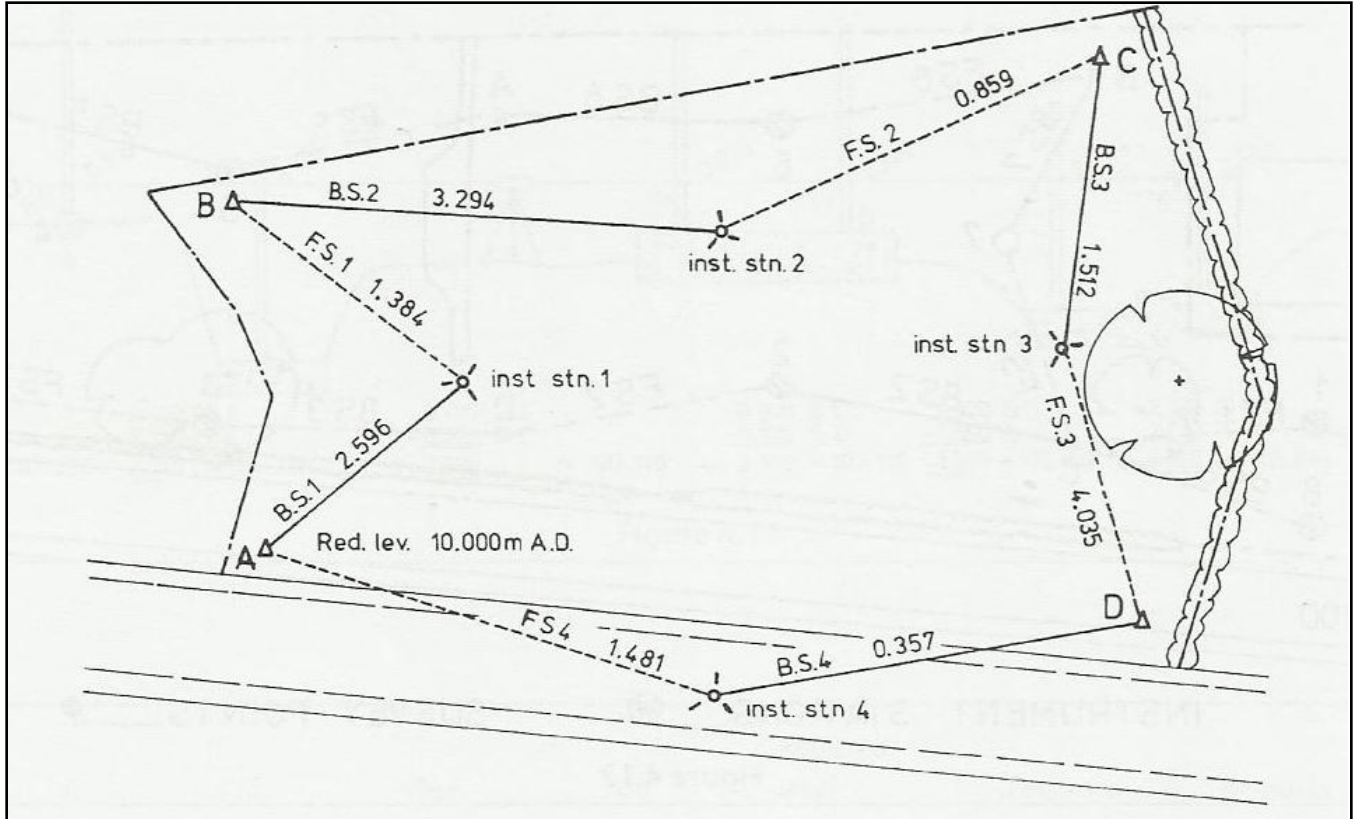


Explain the topographical features portrayed by the sections marked by the following letters

- i. a)
- ii. b)
- iii. c)
- iv. d)
- v. e)

### QUESTION FOUR (MARKS 20)

The figure below shows a proposed construction site with four survey stations (A to D) marked with pegs. The pegs are to be used as Temporary Bench Marks (TBM) for the duration of the construction works. The elevation of peg A has already been established as 10,000m above sea level. Flying levelling was made around the site in order to establish the reduced levels of the pegs.



- i. Book the readings using any appropriate format and calculate the reduced levels
- ii. Carry out a check for arithmetic computations
- iii. Check also the accuracy level

**QUESTION FIVE (MARKS 20)**

The figure below shows a sketch of an engineering site on which a grid system was made and contour survey carried out. The reduced levels of the points on which spot-heights were taken are marked on the corresponding points.

Using a vertical interval of 2m, trace out the following contours on the given plan: 5m, 6m, 7m and 8m. Show all the interpolation calculations.

