

# B. Tech Degree III Semester Examination, December 2006

## CE 302 SURVEYING I (1999 Admission Onwards)

Time : 3 Hours

Maximum Marks : 100

- I. (a) Explain the principle used in chain surveying. What are the limitations of chains surveying? Explain briefly the situations where it can be suitably employed? (12)
- (b) A line was measured with a steel tape which was exactly 30m at 20°C at a pull of 100N, the measured length being 1650.00m. The temperature during measurement was 30°C and the pull applied was 150N. Find the length of the line, if the cross sectional area of the tape was 0.025 sq.cm. The coefficient of expansion of the material of the tape per 1°C =  $3.5 \times 10^{-6}$  and the modulus of elasticity of the material of the tape =  $2.1 \times 10^5 \text{N/mm}^2$ . (8)

OR

- II. (a) Explain reciprocal ranging in detail. When it is adopted? (8)
- (b) Differentiate between : (4)
- (i) Ranging rod and offset rod
- (ii) Check line and Tie line
- (c) A distance of 2000m was measured by a 30m chain. Later on, it was detected that the chain was 0.1m too long. Another 500m was measured and it was detected that the chain was 0.15 m too long. If the length of the chain in the initial stage, was quite correct determine the exact length that was measured. (8)

- III. (a) What is meant by "closing error" of a compass traverse. Show how can it be adjusted by graphical method. (10)
- (b) A closed compass traverse was conducted round a forest and the following whole circle bearings were observed. Determine which of the stations suffer from local attraction and compute the values of the corrected bearings.

Line	FB	BB
AB	74° 20'	256° 00'
BC	107° 20'	286° 20'
CD	224° 50'	44° 50'
DA	306° 40'	126° 00'

(10)

OR

- IV. (a) State the three point problem in planetable surveying and describe how it is solved by Bessel's method. (10)
- (b) What are the advantages and disadvantages of plane table survey over other methods of surveying? (10)
- V. (a) What are the sources of error in leveling? What precautions you will take to avoid them? (8)
- (b) The following readings were successively taken with a instrument in levelling work: 0.32, 0.53, 0.62, 1.78, 1.91, 2.35, 1.75, 0.35, 0.69, 1.24 and 0.98m. The position of the instrument was changed after 3<sup>rd</sup>, 7<sup>th</sup> and 9<sup>th</sup> readings. Rule out the form of a level book and enter the above readings. Assume R.L of the first point as 81.53m. Calculate the R.L of remaining points. Apply usual checks. (12)

OR

(Turn Over)

- VI. (a) Explain the uses of contours. (4)
- (b) Which are the different methods of contouring? (8)
- (c) What are the characteristics of contours? (8)
  
- VII. (a) What is Simpson's Rule in the computation of areas of figures? Derive an expression for it. (10)
- (b) The following offsets were taken from a chain line to a hedge.

Dist in ms	0	30	60	90	120	150	180
Offsets in ms	9.4	10.8	12.5	10.5	14.5	13.0	7.5

Compute the area included between the chain line, the hedge & end offsets by the Simpson's rule. (10)

OR

- VIII. With the help of sketches explain in detail any four minor instruments. (4 x 5 =20)
  
- IX. (a) Differentiate between Bowditch's Rule and Transit Rule. (4)
- (b) Explain in detail the repetition and reiteration methods of theodolite survey. (8)
- (c) An abstract from a traverse sheet for a closed traverse is given below:

Line	Length (m)	Latitude	Departure
AB	200	-173.20	+100.00
BC	130	00.00	+130.00
CD	100	+86.60	+50.00
DE	250	+250.00	0.00
EA	320	-154.90	-280.00

Balance the traverse by Bowditch's Method. (8)

OR

- X. (a) Differentiate between fixed hair method and movable hair method of tacheometry. (10)
- (b) The vertical angles to vanes fixed at 0.5m and 3.5m above the foot of the staff held vertically at a point were + 2° 30' and +4° 12' respectively. Find the horizontal distance and the R.L. of the point if the level of the instrument axis is 125.35 metres above datum. (10)

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