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E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2006.

Third Semester

Civil Engineering

CE 234 — SURVEYING — I

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

Differentiate between :

Plane Surveying and Geodetic surveying.

List the various instruments / accessories used in chain surveying.

The bearing of line PQ is N 50° 25' E. Obtain the bearing of line QP in whole circle bearing system.

Explain the terms 'Dip of a magnetic needle' and 'magnetic declination'.

Bring out clearly the difference between 'back sight' and 'Fore sight' in running a Fly level.

Define 'contour'.

Name the two methods of measuring horizontal angles.

What is meant by a 'closed traverse'?

With the aid of a neat sketch, draw in a simple circular curve.

Define 'sight distance'.

11. (a) (i) What is meant by 'Reciprocal Ranging'? How it is achieved? (2 + 4)

   (ii) The observations of a cross staff survey is recorded below. Plot the boundary of the area ACEBFDA to a rough scale and compute its area analytically.
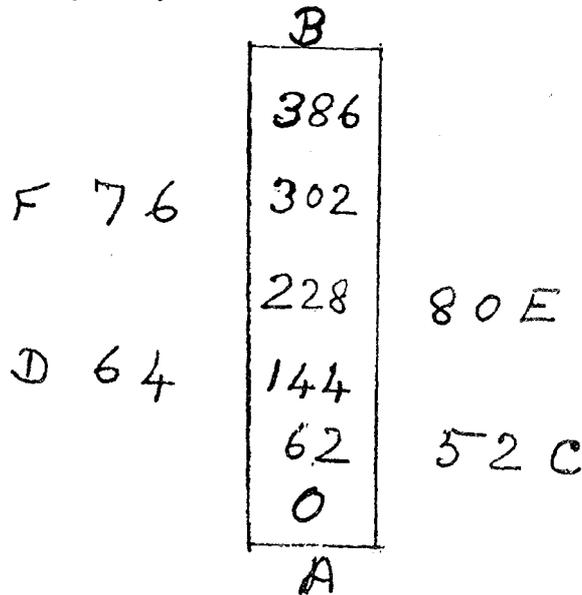
(10)

Or

   (b) (i) Explain the various classifications of surveying. (6)

   (ii) A chain line ABC crosses a river. The points B and C are situated on the near and opposite sides of the river respectively. The bearing of a line BD, perpendicular to AC at B and 50 m long is 45° 20'. The measured bearing of DC is 264° 50'. Find the distance BC. (10)

12. (a) (i) Name the various characteristical methods of Plane Tabling. Explain with sketches any one of them. (2 + 4)

   (ii) The following are the bearings taken on a closed compass traverse. Which of the stations are affected by local attraction? Obtain the corrected bearings of each line.

Line	F.B.	B.B.
AB	S 37° 30' E	N 37° 30' W
BC	S 43° 15' W	N 44° 15' E
CD	N 73° 00' W	S 72° 15' E
DE	N 12° 45' E	S 13° 15' W
EA	N 60° 00' E	S 59° 00' W

Hence obtain the interior angle at A. (8 + 2)

Or

(b) (i) Give, in a tabular form, the differences between prismatic compass and surveyor's compass. (5)

(ii) List the various instruments/accessories used in Plane Table surveying and mention the purpose/use of each one. (5)

(iii) What is 'orientation' in Plane Table survey? Explain any one method of achieving it. (2 + 4)

13. **(a)** (i) Explain, with a sketch and illustration, how you would find the available head room in a hall using a levelling instrument and a levelling staff. (6)

(ii) Details of perpendicular offsets from a survey line are given below. Calculate the area enclosed between the survey line, curved boundary and end offsets by

(1) Trapezoidal rule

(2) Simpson's rule. (5 + 5)

Chainage (m)	0	15	30	45	60	80	100
Offset (m) :	3.8	6.2	5.1	6.8	5.6	4.3	4.1

Or

(b) (i) Draw hypothetical contours representing a 'hillock' and a 'pond' for levels between 10 m and 20 m with a contour interval of 2 m. (4)

(ii) The following successive staff readings were observed while running a fly level between two points, the instrument having been shifted after the third, fifth and eighth readings. Rule out a page of a level book and enter the readings. Hence find the R-L of each staff point, taking the R-L of the first point as 100.000 m. Apply the checks. (4 + 6 + 2)

1.285 ; 2.415 ; 0.780 ; 1.590 ;

1.860 ; 0.590 ; –1.265 ;

0.215 ; 1.155 ; 2.020.

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14. (a) (i) Explain the temporary adjustments of a Transit Theodolite. (6)

(ii) A closed traverse was conducted round an obstacle and the following observations were made. Work out the missing quantities. (10)

Side	Length(m)	Bearing
AB	?	33° 45'
BC	300	86° 23'
CD	?	169° 23'
DE	450	243° 54'
EA	268	317° 30'

Or

(b) (i) What are 'face left' and 'face right' observations? Why is it necessary to take both these observations? (6)

(ii) Describe in brief the construction features of a Transit Theodolite. (10)

15. (a) (i) Why do curves become necessary along highway alignment? Bring out the various classifications of highway curves. (2 + 4)

(ii) A simple circular curve is to have a radius of 573 m. The tangents intersect at chainage 1060 m and the angle of intersection is 120°. Find

(1) Tangent distance

(2) Chainage at beginning and end of curve

(3) Length of long chord

(4) Degree of curve

(5) Number of full and sub-chords. (10)

Or

(b) Write detailed notes on :

(i) Surface surveys in tunnelling operations.

(ii) Setting out works.

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