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B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Fourth Semester

Civil Engineering

CE 239 — SURVEYING II

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

Explain the following :

1. Tangential Tacheometry.

2. Reciprocal Observation.

3. Horizontal and vertical datum in control surveying.

4. Use of modern equipment in control surveying.

5. Accuracy and precision in survey observations.

6. True and most probable values.

7. Map projection.

8. Nautical almanac.

9. Cartography.

10. Rural and urban land survey.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Derive the formula for axis signal correction. (8)

(ii) The following reciprocal observations were made from two points P and Q : (8)

Horizontal distance between P and Q = 6996 m

Angle of elevation of Q at P = 1°56' 10"

Angle of depression of P at Q = 1°56' 52"

Height of signal at P = 4.07 m

Height of signal at Q = 3.87 m

Height of instrument at P = 1.27 m

Height of instrument at Q = 1.48 m

Find the difference in level between P and Q and the refraction correction.

Take R sin 1" = 30.88 m.

Or

(b) (i) Explain the different orders of Triangulation and the conditions for a well conditioned triangle. (8)

(ii) Two triangulation stations A and B are 60 kilometers apart and have elevations 240 m and 280 m respectively. Find the minimum height of signal required at B so that the line of sight may not pass near the ground than 2 metres. The intervening ground may be assumed to have a uniform elevation of 200 metres. (8)

12. (a) (i) Explain the principles of electronic distance measurement. (10)

(ii) Write short notes on luminous signals station and phase correction. (6)

Or

(b) (i) What do you mean by Soundings? Describe briefly the various methods of locating soundings in hydrographic surveying. (10)

(ii) What is strength of fix? Briefly account on its application. (6)

13. (a) (i) Explain the different orientation procedure in Photogrammetry. (8)

(ii) Explain the terms :

(1) Parallax measurement

(2) Stereo pair

(3) Stereoscope

(4) Photo mosaic. (8)

Or

(b) (i) Explain the step-by-step procedure in determining azimuth of a line by observation to sun. (10)

(ii) List the different time system? (4)

(iii) What is celestial sphere? (2)

14. (a) (i) Explain concept of assigning Weight to an observation. (4)

(ii) A surveyor carried out leveling operation of a closed circuit ABCDA starting from A and made the following observation

B was 8.164 m above A, weight 2

C was 6.284 m above B, weight 2

D was 5.626 m above C, weight 3

D was 19.964 m above A, weight 3

Determine the probable height of B, C and D above A by method of correlates. (12)

Or

(b) Explain the concept of adjustment by least squares (6)

The angles of a triangle ABC were recorded as follows:

A =77°14' 20" weight 4, B = 49°40'35" weight 3, C = 53°04'52" weight 2

Give the corrected values of angles. (10)

15. (a) (i) What is meant by "a satellite station"? Explain the reason for using during a trignometrical survey.

(ii) From an eccentric station E, 13.8 m from station A, the angles measured to three trignometrical stations A, B, and C are as follows, the stations C and E being on opposite sides of the lines AB ∠BEC = 68° 26'36" : ∠CEA = 32°45'48"

The length of AC and AB are 5588.4 m and 4371.0 m respectively. Calculate the angle BAC.

Or

(b) (i) A tacheometer was set up at station A and the following readings were obtained on a vertically held staff :

Station	Staff station	Vertical Angle	Hair readings	Remarks
A	B.M.	–2° 18'	3.225, 3.550, 3.875	R.L. of B.M. = 437.655 m
	B	+8°36'	1.650, 2.515, 3.380	

Calculate the horizontal distance from A to B and the R.L of B, if the constants of the instrument were 100 and 0.4. (12)

(ii) What is subtence bar? Where it is used? (4)

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