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Question Paper Code : 33228

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Fourth Semester

Civil Engineering

CE 1254/070100008 — SURVEYING — II

(Regulation 2004/2007)

Time : Three hours

Maximum : 100 marks

Draw neat sketches wherever necessary.

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the different systems of tacheometric survey?
2. Explain the use of a Subtense Bar.
3. What is benchmarking?
4. Why should you work 'from whole to part'?
5. What are systematic error and accidental error?
6. Define Independent quantity and conditioned quantity with example.
7. Distinguish between sidereal time and standard time.
8. What is meant by declination?
9. What is meant by scale of a photograph?
10. Write the concept of map – marking in cartography.

PART B — (5 × 16 = 80 marks)

11. (a) The following is the portion of a field book of tacheometric survey. The tacheometer consisted of an anallatic lens and the multiplying constant was 100. The staff was held vertical. Calculate the reduced levels of all the staff stations and the distances OP and PQ. The height of the instrument at P was 1300 m.

Instrument station	Staff station	Hair readings	Vertical angle	Remarks
O	BM	1.750, 1.950, 2.150	-5°30'00"	
O	P	1.500, 1.650, 1.800	+9°30'00"	RL of BM = 500.00
P	Q	1.890, 2.050, 2.210	+12°00'00"	

Or

- (b) A tacheometer with a multiplying constant 100 and additive constant 0.30 was set up at a station O and the following results were obtained by keeping the staff vertical. Calculate the horizontal distance between O and P and the RL of station P.

Instrument staff	Staff at	Hair readings	Vertical angle	Remarks
O	BM	1.875, 2.150, 2.425	+6°00'00"	RL of BM = 152.60 m
O	P	1.650, 1.800, 1.950	-10°30'00"	

12. (a) (i) Explain the criterion of strength of a figure with reference to a well conditioned triangle. (8)
- (ii) A Tape 20 m long of standard length at 29°C was used to measure a line, the mean temperature during measurement being 19°C. The measured distance was 882.10 m, the following being the slopes: 2°20' for 100 m; 4°12' for 150 m; 1°6' for 50 m; 7°48' for 200 m; 3°00' for 300 m; 5°10' for 82.10 m; find the true length of the line if the coefficient of expansion is 6.5×10^{-6} per degree F. (8)

Or

- (b) Write short notes on:
- (i) Opaque signals. (4)
 - (ii) Selection of site for Base line. (4)
 - (iii) Satellite station. (4)
 - (iv) Weight of an observation. (4)

13. (a) Explain the methods of least square and the methods of equal shifts in survey adjustment. (16)

Or

- (b) Find the most probable values of the angles A and B from the following observations at a station O : (16)

$$\begin{array}{rcll} A & = & 9^\circ 48' 36''.6 & \text{weight 2} \\ B & = & 54^\circ 37' 38''.3 & \text{weight 3} \\ A + B & = & 104^\circ 26' 28''.5 & \text{weight 4} \end{array}$$

14. (a) (i) Explain the three systems of co-ordinates by which the position of a heavenly body can be determined. (12)
- (ii) Find the L.S.T. at a place in longitude $72^\circ 10' E$, at 8 hours 40 min p.m., the G.S.T. of G.M.N. being 6 hour 42 min. 32 sec. (4)

Or

- (b) (i) Describe the Radial line method of plotting from aerial photographs. (8)
- (ii) Write a note on Photo-interpretation. List the elements to be considered. (8)

15. (a) (i) Derive the parallax equation for determining elevation and ground coordinates of a point. (10)
- (ii) A photographic surveying is carried out to a scale of 1:20000. A camera with a wide angle lens of $f = 150$ mm was used with $23 \text{ cm} \times 23 \text{ cm}$ plate for a net 60% overlap along the flight. Find the error in height given by an error of 0.1 mm in measuring the parallax of the point. (6)

Or

- (b) (i) Discuss about various methods of measuring discharge from streams. (12)
- (ii) What is the mean sea level and how is it established? (4)