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Name.....

Reg. No.....

**THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, DECEMBER 2007**

Civil Engineering

CE 04 305—SURVEYING—II

(2004 Admissions)

Time : Three Hours

Maximum : 100 M

Answer all questions.

Part A

1. (a) From the first principle derive the formula for horizontal distance between tacheometer & the staff point.
- (b) What is meant by transition curve ? How will you find the length of the transition curve ?
- (c) How are triangulation survey classified ?
- (d) Given $\alpha = 30^\circ$ weight 2, $\beta = 20^\circ$ weight 3, find the weight of $\alpha + \beta$.
- (e) Write a brief note on astronomical coordinate system.
- (f) What are the uses of field astronomy in surveying ?
- (g) What is meant by stereoscope ? Explain its significance.
- (h) Make a comparison between geodetic observation and plane trigonometric levelling in applying correction for atmospheric refraction, curvature and axis signal.

(8 × 5 = 40 marks)

Part B

2. (a) (i) What is meant by tangential tacheometry ? Deduce expressions for distance and elevations for all the possibilities of vertical angles.

(10 marks)

- (ii) Explain the percentage unit system adopted in tangential tacheometry. (5 marks)

Or

- (b) Give the analytic solution to the three point problem adopted in hydrographic surveying.

(15 marks)

3. (a) (i) What is meant by the eccentricity of signal ? How would you correct the observation when made upon an eccentric signal ?

(10 marks)

- (ii) Find the sag correction for 30 m steel tape under a pull of 80 N in three equal spans of 10 m each. Mass of one cubic cm of steel = 7.88 g/cm³. Area of the cross section of tape = 0.10 cm².

(5 marks)

Or

Turn over

(b) (i) What is spherical excess ? Discuss its determination.

(5 marks)

(ii) The following observations refer to the values of the angles α, β, γ at a triangulation station :—

$$\alpha = 22^\circ 16' 26'' \cdot 3$$

$$\beta = 34^\circ 40' 31'' \cdot 2$$

$$\gamma = 56^\circ 56' 55'' \cdot 8$$

Determine the most probable values of the angles if $\alpha + \beta = \gamma$.

(10 marks)

4. (a) Find the altitude and azimuth of a star from the following data :—

$$\text{Declination of the star} = 21^\circ 40' \text{ N}$$

$$\text{Hour angle of the star} = 41^\circ 10'$$

$$\text{Latitude of the place} = 54^\circ \text{ N}$$

(15 marks)

Or

(b) (i) Derive an expression to get distance between two points on a parallel of latitude.

(8 marks)

(ii) Derive an expression showing relationship between the latitude, declination and altitude.

(7 marks)

5. (a) Derive expressions for various types of scales of a vertical photograph.

(15 marks)

Or

(b) What do you understand by relief displacement on a vertical photograph ? Derive an expression for its determination.

(15 marks)

[4 × 15 = 60 marks]