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Total Number of Pages:

B.TECH
PECI5303

5th Semester Regular / Back Examination 2015-16

SURVEYING-II

BRANCH: CIVIL

Time: 3 Hours

Max marks: 70

Q.CODE: T601

**Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.**

Q1 Answer the following questions: **(2 x 10)**

- a) What are the advantages of tacheometric surveying over other methods?
- b) Differentiate between fixed hair method and movable hair method of tacheometry.
- c) What are the disadvantages of a reverse curve?
- d) What is most probable error?
- e) Differentiate between triangulation and traversing.
- f) What is the extension of base line?
- g) Draw the figure for arrangement of double chain of triangles.
- h) If the focal length of an object glass is 25 cm, Stadia interval is 1.25mm and the distance from object glass to the trunion axis is 15cm, the additive constant is?
- i) What is the function of a parallax bar?
- j) What is the difference between map and aerial photograph?

Q2 a) Derive an expression for the distance between the anallactic lens and object glass. **(3)**

- b)** Points A and B are on opposite sides of a river about 100 m wide. A tacheometer is set up at a point P on the line BA produced and staff readings are taken at A and B. The instrument is then shifted to a point Q on the line AB produced and again the staff readings are taken **(7)**

Instrument at	Staff at	Staff readings
P	A	1.560,1.420,1.280
	B	1.000,0.400,below ground
Q	A	3.240,2.600,1.960
	B	1.600,1.440,1.280

(i) What is the true difference in levels of A and B

(ii) What is the collimation error?

Take $K=100$ and $C=0$

Q3 a) Explain the procedure for setting out a circular curve with two theodolites. **(4)**

- b)** A transition curve is required for a circular curve of radius 300m. The maximum super elevation is restricted to 100 mm for a gauge of 1 m. Determine the length of transition curve and the design speed if **(6)**

- (i) the super elevation is applied at a rate of 1 in 400
- (ii) the super elevation of 4 cm is provided on the distance covered by the vehicle in one second.
- (iii) The rate of change of radial acceleration is $0.3 \text{ m/sec}^2/\text{sec}$.

Q4 a) Observations were made from the instrument station B to the signal at A. The distance AB was 10 km and the diameter of the signal was 15 cm. If the sun rays make an angle of 60^0 with the line AB, calculate the phase correction if the observation was made **(5)**

- (i) on the bright portion
- (ii) on the bright line

b) Discuss in brief the various methods for the measurement of base line. **(5)**

Q5 a) What is meant by the strength of figure? How would you determine it? **(5)**

b) Directions are observed from a satellite station S, 200 m from station C, with the following results **(5)**

$$A = 00^0 00' 00''$$

$$B = 62^0 15' 24''$$

$$C = 280^0 20' 12''$$

The approximate lengths of AC and BC are 25,200 m and 35,500 m respectively. Calculate the angle ACB.

Q6 a) Explain the method of differences for normal equations. **(3)**

b) Find the most probable values of the angles A, B and C of a triangle ABC from the following observations. **(7)**

$$A = 65^0 15' 30'' \quad \text{weight} = 3$$

$$B = 51^0 11' 25'' \quad \text{weight} = 2$$

$$C = 63^0 32' 34'' \quad \text{weight} = 4$$

Q7 a) Explain the following terms with reference to aerial photogrammetry. **(4)**

(i) Scale of photograph (ii) Principal point

(iii) Displacement (iv) Overlap

b) Write down the detailed procedure for laying out of sewer lines **(6)**

Q8 Write short notes on any two: **(5 x 2)**

- a)** Errors in tacheometer
- b)** Method of least square
- c)** Correction to base line measurement using EDM
- d)** Terrestrial photogrammetry