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Total Number of Pages: 02

**B.TECH**  
**PECI5303**

**5<sup>th</sup> Semester Regular / Back Examination 2016-17**

**SURVEYING - II**

**BRANCH: CIVIL**

**Time: 3 Hours**

**Max Marks: 70**

**Q.CODE: Y301**

**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) Name the conditions under which tacheometric surveying is advantageous.
- b) Name different instrumental errors in stadia surveying.
- c) Write any two general requirements of a transition curve.
- d) Find the length of the vertical curve connecting two uniform gradients of + 0.8% and -0.6%, the rate of change of grade being 0.1% per 30 m.
- e) What do you mean by phase of a signal?
- f) What is meant by Base net?
- g) Name different considerations for selection of triangulation stations.
- h) Write any two laws of weights.
- i) What are the functions of a stereoscope?
- j) What is relief displacement?

**Q2 a)** Derive an expression for horizontal distance and vertical difference of height for a vertically held staff when the line of sight is inclined. (4)

- b)** A staff was held vertically at horizontal distance of 45 m and 120 m from the centre of a theodolite fitted with stadia hairs and the staff intercepts with the telescope horizontal were 0.447 and 1.93 m respectively. The instrument was then set over a station P of R.L. 300.25 and the height of the instrument was 1.45 m. The hair readings on the staff held vertically at station Q were 1.20, 1.93 and 2.66 m while the vertical angle was  $9^{\circ}30'$ . Find the distance PQ and RL of Q. (6)

**Q3 a)** Describe briefly the method of setting out a circular curve by offsets from chords produced. (4)

- b)** Two straights AB and BC are intersected by a line DE. The angles ADE and DEC are  $145^{\circ}$  and  $140^{\circ}$  respectively. The radius of the first curve is 400 m and that of the second curve is 600 m. Find the chainages of the tangent points, and the point of compound curvature, given that the chainage of the intersection point is 4415m. (6)

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- Q4 a)** Two triangulation stations A and B are 80 Km apart and have elevations 250 m and 300 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. **(5)**
- b)** What is meant by a satellite station and reduction to centre? Derive expression for reducing the angles measured at the satellite stations to centre. **(5)**
- Q5 a)** What is meant by the strength of figure? How would you determine it? **(5)**
- b)** Observations were made from instrument station A to the signal at B. The sun makes an angle of  $60^\circ$  with the line BA. Calculate the phase correction if (i) the observation was made on the bright portion, and ii) the observation was made on the bright line. The distance AB is 10000 metres. The diameter of the signal is 10 cm. **(5)**
- Q6 a)** Derive the parallax equation for determining heights from a pair of vertical photographs. **(5)**
- b)** Adjust the angle A and B, observations of which give **(5)**
- |                           |            |
|---------------------------|------------|
| A = $20^\circ 10' 10''$   | weight = 6 |
| B = $30^\circ 20' 30''$   | weight = 4 |
| A+B = $50^\circ 30' 50''$ | weight = 2 |
- Q7 a)** A line AB, 1000m long, lying at an elevation of 300m measures 5 cm on a vertical photograph for which focal length is 20 cm. determine the scale of the photograph in an area the average elevation of which is about 500 m. **(4)**
- b)** Describe with neat sketch the detailed procedure for laying out of building. **(6)**
- Q8 Write short notes on any two:** **(5 x 2)**
- a) Analytic lens
  - b) Most probable value
  - c) Correction to base line measurement using EDM
  - d) Aerial photogrammetry
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