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Total Number of Pages: 02

B.Tech  
PECI5303

5<sup>th</sup> Semester Back Examination 2017-18

Surveying-II

BRANCH : CIVIL

Time: 3 Hours

Max Marks: 70

Q.CODE: B337

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) Write the advantages and disadvantages of fixed hair method of tacheometry.
  - b) Enlist the various uses of tacheometry.
  - c) Derive the relationship between the radius and the degree of curve.
  - d) What are the basic criteria for the design of transition curve?
  - e) What do you mean by extension of base line? How is it done?
  - f) Draw the figure for arrangement of centred triangle and polygon.
  - g) List the Laws of Weight.
  - h) Explain the method of least square.
  - i) What fundamental quantities can be measured by a total station?
  - j) Distinguish between terrestrial photogrammetry and aerial photogrammetry:
- Q2** a) Find the focal length of anallactic lens and distance at which it should be placed to get a multiplying constant of 100 from the following data: Focal length of objective lens = 24cm, stadia interval = 0.17cm, distance between the objective lens and vertical axis = 10.5cm. **(5)**
- b) A tacheometer is placed at a station A and readings on a staff held vertical upon a B.M. of RL =100.0 meter and at station B are 0.640, 2.200, 3.760 and 0.010, 2.120, 4.230 m respectively. The angle of depression of the telescope in the first case is 6° 19' and in the second case is 7° 42'. Find the horizontal distance from A to B and the RL of station B, if the instrument has constants 100 and 0.5 **(5)**
- Q3** a) Draw with neat sketch a simple curve showing the elements of it. **(4)**
- b) Two parallel railway lines are to be connected by a reverse curve. If the lines are 10m apart, and the maximum distance between tangent points measured parallel to the straight is 50m. **(6)**
- Find (a) the radius  $R$  if  $R_1 = R_2 = R$   
(b) the radius  $R_2$  if  $R_1 = 50m$   
(c) Also calculate the lengths of both the curves.
- Q4** a) List the factors considered while selecting the site for *base line*. **(4)**
- b) Two triangulation stations A and B are 60 km apart and the elevation of A is 240 m and that of ground at B is 280 m. Find the minimum height of a signal required at B so that the line of sight may not pass near the ground than 2.0 m. Assume elevation of intervening ground uniformly as 210 m. **(6)**

- Q5 a)** The relationship between the angles A, B and C is given by  $A = 4B \times C$ . Angle B is measured as  $20''$  and angle C as  $30''$ . The Standard error in measurement of B is  $\pm 0.03''$  while in the measurement in C it is  $\pm 0.04''$ . Determine the Standard Error of A. **(5)**
- b)** The followings are the direct measurement of a base line:  
3678.32 m, 3678.38 m, 3678.09 m, 3678.29 m, 3678.26 m, 3678.98 m.  
Find the most probable value of the length of the base line and its probable error. **(5)**
- Q6 a)** Directions are observed from a satellite station S, 10m from station A, with the following results  
A =  $00^{\circ} 00' 00''$   
B =  $140^{\circ} 20' 20''$   
C =  $245^{\circ} 30' 25''$   
D =  $305^{\circ} 15' 35''$   
If the lengths of sides AB, AC and AD are 3350.54 m, 4132.43m and 3145.83m respectively. Determine the direction of AB, AC and AD. **(5)**
- b)** Explain the procedure of setting out a building by the method of *circumscribing rectangle*. **(5)**
- Q7 a)** A map of area plotted at scale of 1 in 20,000 is available. If the length of a runway on the map is 120mm, determine the scale. The photo distance of the runway is 188mm. **(2)**
- b)** How would you determine the ground coordinates and elevations in terrestrial photogrammetry? **(4)**
- c)** What are the practical uses of aerial photogrammetry? **(4)**
- Q8 Write short notes on (any two) (5 x 2)**
- a)** Base extension
  - b)** Satellite Station
  - c)** Terrestrial photogrammetry
  - d)** Method of least square