IV Semester B.E. (Civil) Degree Examination, June/July 2016
(Y2K6 Scheme)
CE – 403 : SURVEYING THEORY – II

Time : 3 Hours   Max. Marks : 100

Instructions : i) Answer **any five full** questions.
                ii) **Missing** data may be assumed **suitably**.

1. a) Define the terms :
   i) Face right and face left observations.
   ii) Swinging the telescope.
   iii) Transiting the telescope.
   iv) Telescopic normal.
   v) Horizontal axis and vertical axis. **10**

   b) Explain the step-by-step procedure to measure a horizontal angle by repetition method. **10**

2. a) Discuss the various sources of errors in a theodolite survey. **10**

   b) Explain the term trigonometric levelling and discuss the methods of determining the elevation of objects in space whose base is not accessible. **10**

3. a) What is tacheometric surveying and what is its objective ? Explain how you would obtain in the field the constant of a tacheometer. **10**

   b) Determine the gradient from a point A to a point B from the following observations made with a tacheometer fitted with an anallactic lense. The constant of the instrument was 100 and the staff was held vertically

Inst. Station	Staff Point	Bearing	Vertical Angle	Staff Readings m
P	A	186°	+10°32′	1.360, 1.915, 2.470
	B	276°	+5°6′	1.065, 1.885, 2.705

10

4. a) What do you understand by the following forms of curves and where are they generally used ?
   i) Simple circular curve
   ii) Compound curve
   iii) Reverse curve. **10**

   b) Two tangents intersects at chainage 2000 m, the deflection angle being 50°. Calculate the necessary data for setting out a simple curve of 350 m radius to connect the two tangents if it is intended to set out the curve by Rankine's method of tangential angles. If the theodolite has a least count of $20''$, tabulate the actual readings of deflection angles to be set out. Take peg interval equal to 30 m. **10**

5. a) Describe the procedure of setting out a circular curve using two theodolites. **10**

   b) Two straights with a total deflection angle of $50°30'$ have to be linked by a compound curve having two branches of equal length. The radius of the first branch is 350 m and that of the second branch is 550 m. The chainage of intersection point is 1800 m. Determine the chainages of the two tangent points and that of the point of compound curvature. **10**

6. a) List the factors to be considered in the selection of site for a base line. Explain how you would measure base line in the field. **10**

   b) From an eccentric station S, 13.8 m to the west of the main station B, the following angles were measured. $< BSC = 32°45'48''$ and $< CSA = 68°26'36''$. The stations S and C are to the opposite sides of the line AB. Calculate the correct angle ABC if the length AB and BC are 4371 m and 5588.4m respectively. **10**

7. a) Discuss briefly the location of soundings stations by means of
   i) cross rope soundings
   ii) intersecting ranges. **10**

   b) A, B and C are the visible stations in a hydrographic survey. The sides AB and BC are 3325 m and 3712 m respectively and the angle $< ABC$ is $100°20'30''$. The angle observed with a sextant between A and B and B and C from a sounding boat at 'P' are $39°12'20''$ and $52°48'40''$ respectively. The points B and P are on opposite sides of AC. Find the distances PA, PB and PC. **10**

8. a) Adjust the following station observations : **10**

Station	Observation	Weight
A	34°18′20.4″	1
B	23°32′12.8″	2
C	22°48′32.6″	2
A + B	62°50′29.6″	2
A + B + C	85°39′8.6″	1

b) Explain the terms station adjustment and figure adjustment. **10**

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