Fourth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Surveying – II

Time: 3 hrs.

Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1 a. With neat sketch and tabular column, explain the measurement of horizontal angle by repetition method. List the errors that are eliminated by this method. **(10 Marks)**

   b. Explain the procedures for extending a straight line using a transit when it is in adjustment and not in adjustment. **(10 Marks)**

2 a. Explain with a neat sketch 'two peg method' adopted in the permanent adjustment of a level. **(10 Marks)**

   b. A dumpy level was set up at L_1, exactly midway between A and B which are 50m apart. The readings on the staff when held on A and B were respectively 2.40m and 1.40m. The instrument was then shifted and set up at point L_2 on the line AB produced at 10m from A. The readings on the staff held at A and B were respectively 2.5m and 1.4m. Determine the staff readings on A and B to give a horizontal line of sight. Determine the RL of B, if that of A is 200.00m. **(10 Marks)**

3 a. Explain the method of determining the distance and elevation of an object using trigonometrical levelling, when the base is inaccessible and the instrument stations are in the same plane as that of the object. Derive the required equations. **(10 Marks)**

   b. Find the reduced level of a Church spire 'C' from the following observation taken from two stations A and B, 50mt apart, angle BAC = 60° and angle ABC = 50°, angle of elevation from A to top of spire = 30°, angle of elevation from B to top of spire = 29°, staff reading from A on BM of RL 20m = 2.50m, staff reading from B to same BM = 0.50m. **(10 Marks)**

4 a. Derive the expressions for distance and elevation when the staff is held vertical and the line of sight is inclined. **(10 Marks)**

   b. The following observations were made using a tacheometer fitted with anallactic lens having the constant to be 100 and the staff held vertical:

Inst. Stn	Ht. of instrument	Staff stn	WCB	Vertical angle	Hair reading
0	1.550	A	30° 30′	4° 30′	1.155, 1.755, 2.355
		B	75° 30′	10° 15′	1.250, 2.000, 2.750

Calculate: i) The horizontal distance AB; ii) RL of A and B and iii) Gradient from A to B, if RL of 0 is 150.000m. **(10 Marks)**

PART – B

5 a. What are the different methods of setting out a simple circular curve? **(04 Marks)**

   b. Calculate the ordinates at 10mt distance for a circular curve having a long chord 80 meters and versed sine of 4 mts. **(06 Marks)**

   c. Two tangents interest at a chainage 1000mt, the deflection angle being 28°. Calculate the necessary data to setout a simple circular curve of radius 250 mts. by Rankine's deflection angle method and tabulate the results. Peg interval = 20mt. Least count of theodotile = 20″. **(10 Marks)**

6 a. With neat sketch, explain the various elements of a compound curve. Derive the relations for calculating the chainages of tangent points. **(10 Marks)**

  b. Two tangents AB and BC interest at B. Another line DE intersect AB and BC at D and E such that LADE = 150° and LDEC = 140°. The radius of the first curve is 200m and that of the second is 300m. Calculate all the necessary data for setting out a compound curve if the chainage of B is 1050m. **(10 Marks)**

7 a. What is transition curve? Discuss the purpose of introducing transition curve between a straight and a simple curve. **(06 Marks)**

  b. What is vertical curve? With sketch briefly explain different types of vertical curves. **(04 Marks)**

  c. A transition curve is required for a circular curve of 200m radius the gauge being 1.5m and maximum super elevation restricted to 15cm. The transition is to be designed for a velocity such that no lateral pressure is imposed on the rails and the rate of gain of radial acceleration is 30cm/sec³. Calculate the required length of the transition curve and the design speed. **(10 Marks)**

8 a. What is Simpson's rule? Derive the expression for it. **(06 Marks)**

  b. What is 'zero circle' of a planimeter? Explain any one method of finding its area. **(06 Marks)**

  c. A road embankment is 10mt wide with side slopes 1½ to 1. Assuming the ground to be level in a direction transverse to the centre line, calculate the volume contained in a length of 120 meters, the centre of heights at 20m intervals being in meters. 2.20, 3.70, 3.80, 4.00, 3.80, 2.80, 2.50. **(08 Marks)**

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