Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019

Surveying – II

Time: 3 hrs.   Max. Marks:100

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

PART – A

1   a. Describe the procedure for measuring the horizontal angle by repetition method.   **(10 Marks)**
    b. Explain the procedure for the prolongation of a straight line using theodolite:
        i) Which is in adjustment?
        ii) Which is in poor adjustment?   **(10 Marks)**

2   a. What are the permanent adjustments of a theodolite? Explain the spire test.   **(10 Marks)**
    b. Explain with a neat sketch 'two-peg method' adopted in the permanent adjustments of a level.   **(10 Marks)**

3   a. Explain the method of determining the distance and the elevation of an object using trigonometric leveling, when the base in inaccessible and the instrument stations are in the same plane as that of the object. Derive the required equations.   **(10 Marks)**
    b. Determine the height of the pole above the ground on the basis of the following angles of elevation from two instrument stations A and B, in line with the pole.
        Angle of elevation from A to the top and bottom of the pole : 30° and 25°
        Angle of elevation from B to the top and bottom of the pole : 35° and 29°
        Horizontal distance AB = 30 m
        The readings obtained on the staff at the BM with the two instrument settings are 1.48 m and 1.32 m respectively. What is the horizontal distance of the pole from A?   **(10 Marks)**

4   a. Explain the method of determining the constants of tacheometer in the field.   **(10 Marks)**
    b. Determine the gradient from the point P to another point Q from the following observations made with a tacheometer fitted with an anallactic lens. The constants of the instrument were 100 and 0 and the staff was held vertical.

Instrument station	Staff station	Bearing	Vertical angle	Staff Readings (m)
R	P	130°	+10°32′	1.255, 1.810, 2.365
	Q	220°	+5°06′	1.300, 2.120, 2.940

(10 Marks)

PART – B

5   a. Explain the method of setting out of a simple curve by off-sets from chord produced method with a neat sketch.   **(10 Marks)**
    b. A simple circular curve of radius 450 m and deflection angle 70° was to be set out. The chainage of the point of the curve was 1022 m. Due to inaccessibility problem it was required to rotate the forward tangent by 12° about the point of tangency. Find the new radius and the chainage of the tangent points and that of the point of intersection.   **(10 Marks)**

6 a. What is transition curve? State the various types of transition curves with the help of neat sketch. Explain briefly its necessity. **(10 Marks)**

b. A reverse curve is to join two straight having a very acute angle of intersection. The common tangent (140 m) makes an angle of intersection of 120° and 130° with the main straights. Calculate the suitable common radius. **(10 Marks)**

7 a. Define a compound curve. Describe briefly the setting out of a compound curve. **(10 Marks)**

b. A compound curve is made up of two arcs of radii 320 m and 510 m. The deflection angle of the combined curve is 100° and that of the first arc of radius 320 m is 54°. The chainage of the first tangent point is 920 m. find the chainage of the point of intersection; common tangent point, and forward tangent point. **(10 Marks)**

8 a. Derive an expression for trapezoidal formula for volume calculations. **(10 Marks)**

b. A railway embankment is 12 m wide. The ground is level in a direction transverse to the central line. Calculate the volume contained in 100 m length by trapezoidal and prismoidal rule, if the side slope is 1.5:1. The central height at 20 m interval are 3.70 m, 2.60 m, 4.0 m, 3.4 m, 2.8 m, 3.0 m and 2.2 m. **(10 Marks)**

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