U.S.N

P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)
Fourth Semester, B.E. – Civil Engineering
Semester End Examination; June - 2017
Applied Surveying

Time: 3 hrs — Max. Marks: 100

Note*: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1 a. Derive the expression for calculating the elevation of the top of the object when the base of the object is inaccessible and instruments are at different levels. — 10

b. An instrument was set up at P and the angle of elevation to a vane 4 m above the foot of the staff held @ Q was 9°30'. The horizontal distance between P and Q has 2000 m. Determine the R.L of the staff station Q, given that the RL of the instrument axis was 2650.38 m. — 10

2 a. What is Tacheometer? Derive the expression, $D = KS+C$ from first principle. — 10

b. The elevation of a point P is to be determined by observations from two adjacent stations of a tacheometric survey. The staff was held vertically upon the point and the instrument is fitted within an anallactic lens. The constants of the instruments being 100 and 0, compute the elevations of the point P from the following data, taking both the observations as equally trustworthy. Also calculate the distance of A and B from P. — 10

Instrument Station	Height of Axis (m)	Staff point	Vertical Angle	Staff Reading (m)	Elevation of the station (m)
A	1.42	P	+2°24'	1.230, 2.055, 2.880	77.750
B	1.40	P	–3°36'	0.785, 1.800, 2.815	97.135

UNIT - II

3 a. Explain the construction of a simple curve by Rankine method of tangential angles. — 10

b. The tangents intersect at chainage 59+60, the deflection angle being 50°30'. Calculate the necessary data for setting out a curve of 15 chains radius to connect the two tangents, if it is intended to setout the curve by offsets from chords. Take peg interval equal to 100 links, length of the chain being equal to 20 m (100 links). — 10

4 a. Explain with a neat sketch the elements of a compound curve. — 10

b. Two straights AB and BC are intersected by a line D_1D_2. The angles BD_1D_2, and BD_2D_1 are 40°30' and 36°24' respectively. The radius of the first arc is 600 meters and that of the second arc is 800 meters. If the chainage of intersection point B is 8248.1 metres. Find the chainages of tangent points, and the point of compound curvature. — 10

UNIT - III

5 a. Define reverse curve. Explain the elements of a reverse curve with a neat sketch.   10

   b. Two straights AB and CD intersect @ V. BD is the common tangent of length 200 metres. It
      is proposed to introduce a reverse curve consisting of two arcs of equal radii between them.
      The angles ABD and CDB are 150°30 and 43°42' respectively. Calculate;
      (i) Common radius
      (ii) The chainages of PC, PRC and PT and if that of B is 9245.2 metres.   10

6 a. Define vertical curve. Explain the various types of vertical curve with a neat sketch.   10

   b. Explain the various methods of determining the length of transition curve.   10

UNIT - IV

7 a. Explain the function and the working principle of total station.   10

   b. Briefly describe the advantages and disadvantages of total station.   10

8 a. Explain the importance and the essential components of Remote sensing.   10

   b. Distinguish between active and passive remote sensing system.   10

UNIT - V

9 a. Explain the principles of GPS.   6

   b. Distinguish between handheld GPS and differential GPS.   6

   c. List the advantages and disadvantages of GPS.   8

10 a. What is GIS? What are the applications of GIS?   8

   b. With a neat sketch, explain the components of GIS.   6

   c. Distinguish between spatial and non-spatial data.   6

✳ ✳ ✳ ✳