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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; May / June - 2019
Applied Surveying
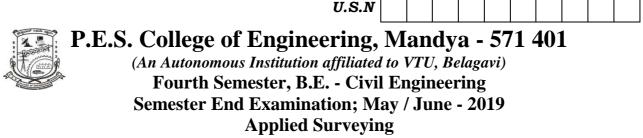
Time: 3 hrs   *Max. Marks: 100*

*Note: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.*
      ii) Assume missing data if any.

UNIT - I

1 a. Derive equations for horizontal distance and elevation of an object; for single plane observation, when the instrument axes at very different level.   10

b. Find the elevation of the top of a chimney from the following data :   10

Instrument Station	Reading on B.M	Angle of elevation	Remarks
A	0.862 m	18° 36′	RL of B.M = 421.380
B	1.222 m	10° 12′	Distance AB = 50 m

2 a. What are the advantages and disadvantages of tachometric surveying?   4

b. Explain the method of determining the contents *K* and *C* of a tachometer in the field when line of sight is horizontal.   6

c. A tachometer was setup at a station A and the readings on a vertically held staff at B were 2.255, 2.605 and 2.955. The line of sight being at an inclination of +8°24′. Another observation on the vertically held staff at BM gave the readings 1.640, 1.920 and 2.200. The inclination of the line of right being   +1°6′. Calculate the horizontal distance between A and B, and the elevation of B, if the RL of B is 418.685 m. The constant of the instruments were 100 and 0.3.   10

UNIT - II

3 a. Define the following with respect to a simple circular curve :   6

  i) Point of curve   ii) Point of tangency   iii) Mid ordinate
  iv) Apex distance   v) Length of curve   vi) Length of long chord

b. List the various methods of setting out simple curves. Explain the methods of offsets from long chord.   6

c. Calculate the tangent length of curve, apex distance and mid ordinates to connect two tangents having angle of deflection 80° by a circular curve of 400 m radius.   8

4 a. With a neat sketch, explain the elements of compound curve with relevant equations.   8

b. Two tangents AB and BC intersect at B. Common tangent EF drawn at PCC such that $\underline{|BEF} = 40°$ and $\underline{|BFE} = 40°.$ The radius of the first curve is 200 m and that of for second curve is 300 m. The Chainage of P.I is 950 m. Calculate necessary data to set out curve from PC. Unit chord length = 20 m. Least count of theodolite being 20″.   12

UNIT - III

5 a. Two parallel railway lines are to be connected by a reverse curve, each section having the same radius. If the lines are 12 m apart and the maximum distance between tangent points measured parallel to the straight is 48 m, find the maximum allowable radius. If however, both the radii are to be different, calculate the radius of the second branch if that at the first branch is 60 m. Also calculate the lengths of both the branches.   10

   b. What is transition curve? Why and where these curves are provided? List the functions of a transition curve.   6

   c. Define; i) Super elevation   ii) Centrifugal ratio   4

6 a. In a road curve between two straights having deflection angle of 108°. Bernoulli's lemniscates is used as a curve transitional throughout. Make necessary calculations for setting out the curve of the apex distance is 20 m. Set the curve with angle increasing by 2°.   10

   b. With a neat sketch, explain different types of vertical curves.   8

   c. Differentiate between valley curve and summit curve.   2

UNIT - IV

7 a. What is total station? Explain the different components of the total station.   10

   b. What are the functions of total station? Explain them in brief.   10

8 a. Define Remote sensing. Explain the principles of Remote sensing.   10

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

UNIT - V

9 a. Explain working principle and segments of GPS.   10

   b. Distinguish between hand held GPS and differential GPS.   10

10 a. Define GIS. What are the applications of GIS?   10

   b. Explain the components of GIS with flow diagram.   10

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