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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 - 2018
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 formula for calculating elevation of the top of the object when the base is in accessible instrument stations not in the same vertical plane on the elevated object. | 10

 b. In order to ascertain the elevation of top(Q) of the signal on a hill, observations were made from two stations P and R at a horizontal distance 100 mt apart, the stations P and R being in line with Q. The angles of elevation of Q at P and R are 28°42′ and 18°6′ respectively. The staff reading upon Benchmark of elevation 287.250 m were respectively 2.870 and 3.750 when the instrument was at P and at R. The telescope being horizontal. Determine the elevation of the foot of the signal, if the height of the signal above its base is 3 meter. | 10

2 a. Explain how would you determine constant of a tachometer? | 6

 b. Derive the Tachometer equation, when the line of sight in horizontal and the staff held vertical. | 6

 c. A Tachometer was setup at 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 in vertically held staff at B.M. gave the readings 1.640, 1.9200 and 2.200, the inclination of the line of sight bring +1°6′. Calculate the horizontal distance between A and B, and the elevation of B if the R.L. of BM is 418.685 meters. The constants of the instruments were 100 and 0.3. | 8

UNIT - II

3 a. List the different methods of setting out simple circular curve by linear and angular methods. Explain the method of offset from long chord. | 10

 b. Two tangents interrupt at chainage 1000 mt, The deflection angle being 28º. Calculate the necessary data for setting out a simple circular radius 200 m by Rankine method. Take peg interval as 20 mt. | 10

4 a. With a neat sketch, derive the various elements of a compound curve, given Δ, R_1, R_2, T_s, T_L, $Δ_1$, $Δ_2$ and T_L | 10

 b. Two straights with a total deflection angle of 72° are to be connected by a compound curve of two branches of equal length. The radius of the first branch is 300 mt, and that of the second branch is 400 mt. The chainage of intersection point is 1500 mt, calculate the chainage of tangent pointes and that of PCC. | 10

UNIT - III

5 a. What is a Transition curve? List the functions and essential requirements of an ideal transition curve.

10

b. A Transmission curve is required for a circular curve of 200 mt radius. The gauge being 1.5 mt and maximum super elevation is restored to 15 cm. 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 accelerations is 300 m/s^2. Calculate the required length of transition curve and design speed.

10

6. a Define a Reverse curve, with a neat sketch derive the various elements of reverse curve provided between two parallel straights.

10

b. Two parallel straights 9 mt apart are to be connected by a reverse curve. If the distance between two tangent points is 72 mt. Find the common radius of the two branches, if the radius of 1st branch is 100 mt, find the radius of the second branch.

10

UNIT - IV

7 a. Explain working principles of total stations and salient features of total station.

10

b. Explain how to calculate the coordinate? State the advantages and disadvantages of total stations.

10

8 a. Define Remote sensing. Explain Essential components of Remote sensing.

10

b. Differentiate active and passive remote sensing system.

10

UNIT - V

9 a. Explain working principles of GPS and distinguish between hand-held GPS and differential GPS.

10

b. What are the applications of GPS and mention the advantages and disadvantages.

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10 a. What is GIS? With sketch explain the components of GIS.

10

b. What are the applications of GIS?

5

c. Distinguish between special and Non-spatial data.

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