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# P.E.S. College of Engineering, Mandya - 571 401
*(An Autonomous Institution affiliated to VTU, Belgaum)*
**Third Semester, B.E. - Civil Engineering**
**Semester End Examination; Dec - 2016/Jan - 2017**
**Surveying - I**

*Time: 3 hrs*                                                        *Max. Marks: 100*

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

## UNIT - I

| | | |
|---|---|---|
| 1 a. | Distinguish between Plane surveying and Geodetic surveying. | 6 |
| b. | Explain the classification of surveying based on nature of the field survey, objectives of the survey and instruments used. | 8 |
| c. | Explain the measurement of distance on sloping ground. | 6 |
| 2 a. | Explain the indirect methods of ranging. | 8 |
| b. | Write equations for corrections for temperature, pull, sag and slope to be applied for a tape. | 6 |
| c. | The distance between two points measured along a slope is 126 m. Find the horizontal distance between them. If, <br> i) The angle of slope between the points is 6º 30′ <br> ii) The difference in level is 30 m        iii) The slope is 1 in 4. | 6 |

## UNIT - II

| | | |
|---|---|---|
| 3 a. | With neat sketch define the following terms : <br> Station, Baseline, Tie line, Check line. | 6 |
| b. | Explain the working principle of optical square. | 8 |
| c. | With neat sketch, explain the erection of perpendicular to a given chain through a point on it. | 6 |
| 4 a. | What are the different types of obstacles in chaining and explain how do you overcome them? | 8 |
| b. | Sketch the symbols used in surveying for building, rock bed, cultivated land and pond. | 6 |
| c. | Explain the calculation of area by; <br> i) Trapezoidal rule        ii) Simpson's rule. | 6 |

## UNIT - III

| | | |
|---|---|---|
| 5 a. | Differentiate between prismatic and surveyor's compass. | 10 |
| b. | Determine the included angles of closed traverse ABCDA conducted in clockwise direction. The following are bearings observed of respective lines. | 10 |

| Line | | FB |
|------|---|------|
| AB | - | 40º |
| BC | - | 70º |
| CD | - | 210º |
| DA | - | 280º    Apply the check. |

6 a. Illustrate the relationship between fundamental lines of theodolite. 8

 b. With tabular column explain how to measure horizontal angle by; 12

   i) Repetition method    ii) Re-iteration method?

## UNIT - IV

7 a. Define: BS, IS, FS, HI, RL, BM. 6

 b. The following consecutive readings were taken with a level and 3 m levelling staff on continuously sloping ground at a common internal of 20 m.

   0.602, 1.234, 1.860, 2.574, 0.238, 0.914, 1.936, 2.872, 0.568, 1.824, 2.722

   The RL of 1$^{st}$ point was 199.122. Enter the readings in a page of level book and calculate the RLs of all the points and gradient of the line joining the 1$^{st}$ and last point. Apply the Arithmetic check. 14

8 a. Derive an equation for correction for curvature, refraction and combined for horizontal line of sight. 6

 b. With neat sketch, explain the reciprocal leveling and derive the equation for true difference. 6

 c. The following notes were observed to reciprocal levels taken with one level.

| Instrument Near | Staff reading on | | Remarks |
|---|---|---|---|
| | P | Q | |
| P | 1.824 | 2.748 | Distance PQ = 1010 m |
| Q | 0.928 | 1.606 | RL of P = 126.386 |

8

 Find;

 i) The True RL of Q

 ii) The combined correction for curvature and refraction

 iii) Angular error in the collimation adjustment.

## UNIT - V

9 a. What are the advantages and disadvantages of plane table surveying? 6

 b. What are the uses of plane table surveying? 6

 c. Explain the Bessel's graphical method for solving 3-point problem. 8

10 a. What are the characteristics of a contour? 6

 b. Explain how do you determine the inter visibility between any two points shown on contour plan? 8

 c. Explain the Arithmetic interpolation of contour. 6

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