



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

(An Autonomous Institution affiliated to VTU, Belagavi)

Third Semester, B.E. - Civil Engineering

Semester End Examination; Dec - 2017 / Jan - 2018

Surveying - I

Time: 3 hrs

Max. Marks: 100

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

UNIT - I

- 1 a. Explain the basic principles of surveying. 6
- b. Distinguish between Plane and Geodatic surveying. 6
- c. What is Topo map? Explain about the survey of India topographical maps and their numbering. 8
- 2 a. Write a neat sketch explain Reciprocal method of ranging indicating when it is adopted. 8
- b. Write a short note on EDM. 6
- c. Calculate the sag and pull for a tape of 20 m long standardized at 55°F with a pull of 10 kg used for measuring base line. Find correction per tape length, if the temp at the time of measurement was 80°F and pull exerted was 16 kg. Weight of 1 cubic cm of steel = 7.86 g.wt of tape = 0.8 kg and $E = 2.109 \times 10^6 \text{ kg/cm}^2$. Coefficient of expansion of tape per 1°F = 6.2×10^{-6} . 6

UNIT - II

- 3 a. What are the conditions to be filled by surveying or survey stations? 6
- b. With neat sketch define the following :
- i) Station ii) Baseline 6
- iii) Tie line iv) Check line.
- c. A and B are two points on the opposite sides of a pond. The surveyor establishes a line AC clear of the pond such that B is visible from C. He establishes another point D on the line CB produced so that the line AD is also clear of the pond. If the distance AC, CB, BD and DA are 300 m, 150 m, 120 m and 250 m respectively. Determine the distance AB. 8
- 4 a. Explain the calculation of area by i) Trapezoidal rule and ii) Simpson's rule. 10
- b. A series of offsets were taken from a chain line to a curved boundary at intervals of 15 m in the following order :
- 0, 2.65, 3.80, 3.75, 4.65, 3.60, 4.95, 5.85 m; 10
- Compute the area between the chains. The curved boundary and end offsets by;
- i) Trapezoidal rule ii) Simpsons rule.

UNIT - III

- 5 a. Distinguish between :
- i) Fore bearing and Back bearing
 - ii) True Maridean and Magnetic maridean
 - iii) Dip and Declination
 - iv) Whole circle and Reduced bearing.
- b. The following bearings were observed with a compass. Calculate interior angle. Represent the result with a sketch.

Line	AB	BC	CD	DE	EA
Fore bearing	64°30'	130°00'	47°00'	210°30'	310°30'

- 6 a. List the fundamental axes of a Theodolite and their relation.
- b. Explain Repetition and Restoration method of measuring horizontal Angles.

UNIT - IV

- 7 a. Define the following terms :
Bench marks, level surface, Reduced level, Foresight, Back sight, Change of point.
- b. The following staff readings were observed successively with a level. The instruments have been shifted after 3rd, 6th, 8th readings: 2.228, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 1.044, 2.684 meters. Enter the readings in field book. Calculate the RL of all the points: BM of 1st point is 432.384 m.
- 8 a. Obtain equations for curvature and refraction correction in leveling.
- b. The consecutive readings were taken with a level and 5 m leveling staff on a continuously sloping ground at an interval of 20 m: 0.385, 1.030: 1.925: 2.825: 3.730; 4.685; 0.625; 2.005; 3.110; 4.485. The RL of 1st point was 208.125 m. Rule out a page of level field book. Calculate the RL of all points by rise and fall method and also the gradient of the line joining the first and last point.

UNIT - V

- 9 a. What is a contour? Explain the characteristics with sketch.
- b. Explain briefly the methods of interpolation of contours.
- c. Draw a contour sketch to identify the following :
i) Hill and Pond ii) Steep slope, Gentle slope, Uniform slope
- 10 a. List the accessories required for plane table surveying and mention its uses.
- b. Explain Intersection method in plane table surveying. Indicate in what situation those methods are selected?
- c. What are the advantages and disadvantages of plane table surveying?