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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, 6
- i) The angle of slope between the points is $6^{\circ} 30'$
- ii) The difference in level is 30 m iii) The slope is 1 in 4.

UNIT - II

- 3 a. With neat sketch define the following terms : 6
Station, Baseline, Tie line, Check line.
- 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; 6
- i) Trapezoidal rule ii) Simpson's rule.

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. 10
- The following are bearings observed of respective lines.

Line	FB	
AB	-	40°
BC	-	70°
CD	-	210°
DA	-	280°

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 interval 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 14
The RL of 1st 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 1st and last point. Apply the Arithmetic check.
- 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

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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