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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

Basic Surveying

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. How will you classify surveying? 10

b. At the end of a survey work, a 20 m chain was found to be 6 cm too long. The area of the plan drawn with the measurements taken with this chain is 122 cm^2 and the scale adopted was 10 m to a 1 cm. What is the true area of the field, if the chain was exactly 20 m long at the commencement of the work? 10

2 a. With a neat sketch, explain reciprocal ranging. 10

b. The length of a chain line measured with a 20 m chain was 1341 m. The same line was found to be 1350 m long, when measured with 30 m chain is 20 cm too short. What was the error in 20 m chain? 10

UNIT - II

3 a. Distinguish between Open Traverse and Closed Traverse. 4

b. Distinguish between surveyors compass and prismatic compass. 6

c. Following are the bearings of the sides of a closed traverse:

Side	Fore bearing
AB	60º30′
BC	122º0′
CD	46º0′
DE	205º30′
EA	300º00′

Workout the interior angles of the traverse and apply the check 10

4 a. What is error of closure? How it is balanced graphically. 10

b. The following table gives the lengths and bearings of the lines of a traverse ABCDE, the length and bearing of EA having been omitted. Calculate the length and the bearing of the line EA.

Line	Length (m)	Bearing
AB	204.0	87º30′
BC	226.0	20º20′
CD	187.0	280º0′
DE	192.0	210º30′
EA	?	?

10

UNIT - III

5 a. Explain the following terms:

i) Level surface ii) Level line iii) Horizontal line iv) Line of collimation. 8

Contd…2

b. The following consecutive reading were taken with a level and 4 m leveling staff on a continuously sloping ground at a common interval of 30 m, 0.855 (on A), 1.545, 2.335, 3.115, 3.825, 0.455, 1.380, 2.055, 2.855, 3.455, 0.585, 1.015, 1.850, 2.755, 3.845 (on B). The RL of A was 380.500 m, make the entries in the level book and apply the usual check. Also determine the gradient of AB. 12

6 a. Explain the following :

i) Rise and fall method ii) Height of Instrument method. 10

b. The following staff readings were observed successively with a level, the instrument having been moved forward after the second, fourth and eighth readings 0.875, 1.235, 2.310, 1.385, 2.930, 3.125, 4.125, 0.120, 1.875, 2.030, 3.765.

The first reading was taken with the staff held upon a bench mark of elevation 132.135 m. Enter the readings in the level book form and reduce the levels. Apply the usual checks. Find also the difference in the level between the first and the last point. 10

UNIT - IV

7 a. List the characteristics of a contour with a neat sketch. 10

b. Define contour. What do you understand by the contour interval and on what factors does it depend? 10

8 a. Explain the method of intersection in plane table surveying for plotting the area. 10

b. Briefly explain the working principle of :

i) Planimeter ii) Ceylon ghat tracer. 10

UNIT - V

9 a. Explain the following terms with reference to the theodolite :

i) Transiting ii) Swinging iii) Line of collimation

iv) Horizontal axis v) Face left observation. 10

b. With a neat sketch and tabular column, explain the measurement of horizontal angle by repetition method. List the errors that are eliminated by this method. 10

10 a. The following perpendicular offsets were taken from a chain link to a hedge:

Chainage (m):	0	15	30	45	60	70	80	100	120	140
Offsets (m):	7.60	8.5	10.7	12.8	10.6	9.5	8.3	7.9	6.4	4.4

Calculate the area between the survey line, the hedge and the end offset by; 10

i) Trapezoidal rule ii) Simpson's rule.

b. A railway embankment is 10 m wide with side slopes 1.5 to 1. Assuming the ground to be level in a direction transverse to the centerline. Calculate the volume contained in a length of 120 m, the centre heights at 20 m intervals being in meters: 10

2.2, 3.7, 3.80, 4.0, 3.8, 2.8 and 2.5.

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