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Code No.: 21006

VASAVI COLLEGE OF ENGINEERING (*Autonomous*), HYDERABAD
B.E. II Year (Civil) I – Semester (Main) Examinations, December – 2015

Surveying-I

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE questions from Part-B

Part-A (10 X 2=20 Marks)

1. Define the reciprocal ranging.
2. Define the Simpson' rule.
3. Differentiate the terms Magnetic Declination and Dip.
4. Define the terms agonic lines and Declination.
5. State the errors in plane table surveying.
6. Define the terms: orientation and resection.
7. State the basic difference between dumpy level and tilting level.
8. Define Grade Contour and where it is useful.
9. Enumerate different types of errors found in Theodolite Survey.
10. In a closed traverse, latitudes and departures of the sides were calculated and it was found that, $\sum L = +1.39$ m and $\sum D = -2.17$ m, Calculate the bearing of the closing error.

Part-B (5 X 10=50 Marks)

11. a) A 20 m steel tape was standardized when fully supported under 8 kg pull at a temperature of 22°C. The length measured was 2250 m. Temperature at the measurement was 28°C and the pull applied as 13 kg. Find the true length of the line, if cross sectional area of the tape was 0.025 sq. cm. The co-efficient of expansion of the tape material is $3.5 \times 10^{-6}/^{\circ}\text{C}$ and the young's modulus of the tape material is 2.1×10^6 kg/cm². [6]
b) Write the working principle of Optical Square. [4]
12. a) A closed compass traverse survey was conducted round a compound wall and the QB were observed. Determine which of the stations are affected by local attraction? [6]

<u>LINE</u>	<u>FORE BEARING</u>	<u>BACK BEARING</u>
PQ	N 46° 10' E	S 46° 10' W
QR	S 60° 40' E	N 61° 20' W
RS	S 10° 30' E	N 8° 50' W
SP	N 79° 40' W	S 80° 40' E

b) Write the method of distribution of closing error by graphical method of Bowditch's method. [4]
13. a) Explain the three point problem of resection with Lehmann's rules. [5]
b) Explain the two point problem with a sketch. [5]

Contd...2

14. a) The following readings were obtained from a reciprocal observations:
The horizontal distance between P and Q is 1110 m and the RL of P = 130.815m.
Determine (i) True RL of Q (ii) Angular error in the collimation adjustment of the instrument. [6]

Instrument at	P	Q
Staff readings on P	1.824	0.929
Staff readings on Q	2.748	1.606

- b) Differentiate between height of instrument method of reduction of Level and rise and fall method with any sample. [4]
15. a) The co-ordinates of A and B are given below. Third point C has been chosen such a way that bearing of line AC and CB are $29^{\circ} 30'$ and $45^{\circ} 45'$ respectively. Calculate the lengths of lines AC and CB. [5]

Point	Northing	Easting
A	150	200
B	1500	1300

- b) Define balancing of Traverse and enumerate different methods of balancing of a closed traverse and explain any two methods in detail. [5]
16. a) A Chain line AB crosses a river. M and N being on the near and distant banks respectively. A point P is measured 105 m at right angles to the AB from M. At P, PA and PN are set out such that angle APN is 90° . AM is measured as 85 m. Determine width of the river (as MN). [6]
- b) Compare the working principle of prismatic and surveyors compass, with diagrams. [4]
17. Write short notes on any two of the following:
- a) Various instruments and accessories used in plane table survey [5]
 - b) Derivation of expression for determination of curvature and refraction correction [5]
 - c) Functions of various parts of theodolite with neat sketch. [5]
