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FACULTY OF ENGINEERING
B.E. 2/4 (Civil Engg.) II Semester Examination, May/June 2012
SURVEYING – II

Time: 3 Hours] [Max. Marks : 75

Note : *Answer **all** questions from Part **A**, Answer **five** questions from Part **B**.*

PART – A **(25 Marks)**

1. What are the sources of errors in theodolite ?
2. What do you understand by balancing traverse ?
3. Why face left and face right observations taken in theodolite survey ?
4. Under what circumstances trigonometric leveling is preferred ?
5. Write the formula for observations in trigonometric leveling, the height difference between two points.
6. What is least count ? How can it be found out for a particular instrument ?
7. Write the relation between the radius of curve and degree of a curve.
8. Describe where the transition curve is provided. State the formula for finding the length of a transition curve.
9. Write the significance of sounding cable and echo-sounder in hydrographic survey.
10. The micrometer readings of a subtense theodolite are 3.455 and 3.305. The distance between the targets is 4m. The constants of the instrument are 600 and 0.50 m. Calculate the distance between the instrument and the staff.

PART – B **(50 Marks)**

11. a) What are the main features of modern theodolite ? Explain the temporary adjustments of a transit theodolite.

    b) Describe the method of repetition for measurement of horizontal angle by theodolite.

12. a) What are the various methods of doing the theodolite traversing ? Describe the deflection angle method in detail.

b) From the following data, state whether the traverse is balances or not ? If not, what is the closing error and relative error of closure ?

Line	Length in meters	Latitude	Departure
AB	470	N 436.90	W 173.30
BC	635	N 84.72	E 620.40
CD	430	S 418.30	E 96.65
DA	575	S 400.60	W 550.80

13. a) What are the different methods of adjusting a traverse in Gale's system ? Explain one of the rules in details.

b) The latitudes and departures of the survey lines of a traverse ABCD are given as follows : calculate its area by any one method.

Line	Latitude (m)	Departure
AB	+ 204.60	+ 113.90
BC	– 234.90	+ 206.70
CD	– 150.70	– 87.25
DA	+ 181.0	– 233.80

14. a) Describe the difference between the techniques of reciprocal leveling and reciprocal trigonometrical leveling, and discuss the conditions in which each is most effectively used.

b) The distance between two stations A and B is 6370 m. The station B was 200 m above the station A. Calculate the angles observed from A and B. Assume that the instrument and signal heights to be equal and the effect of refraction as $1/7^{th}$ of that of the curvature. The radius of earth is 6370 km.

15. a) What are the methods of setting out simple curves ? Explain Rankine's method of tangential angles for setting out curves.

b) The chainage of the intersection of two straights having the deflection angle of 50° is 1780.50 m. If the radius of the curve is 430 m, calculate the following :

i) tangent distance
ii) length of the curve
iii) chainages of PC and PT
iv) length of the long chord
v) degree of curve
vi) apex distance and
vii) mid-ordinate.

16. a) What is a compound curve ? Derive relationships between various elements of a compound curve.

b) On the basis of a preliminary survey it was proposed to connect two straights having deflection angles of 114°, by a circular curve of 410 m radius. Later, however, it was decided to shift the forward tangent outward parallel to itself by a distance of 60 m. Calculate :

i) the new radius of the curve.
ii) the chainages of the PI and PT if the position of the original PC is not to be changed. The chainage of PC is 681.60 m.

17. a) Differentiate between the fixed hair method and movable hair method ? Discuss advantages and disadvantages of each method.

b) The following readings were taken on a vertical staff with a tacheometer fitted with an anallactic lens :

Staff Station	Bearing	Vertical Angle	Staff readings
A	34° 20′	+11°	0.850, 1.410, 1.970
B	202° 50′	- 4°	0.775, 1.785, 2.985

The value of k for the instrument is 100, calculate the difference of level between A and B and the distance AB.