Reg. No. : | | | | | | | | | | | |

R 3164

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Fourth Semester

Civil Engineering

CE 1254 — SURVEYING — II

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the difference between a theodolite and tacheometer?

2. What is tangential tacheometry?

3. What is meant by phase of a signal?

4. Enlist the types of signals used in triangulation.

5. Differentiate between conditioned quantity and conditional equation.

6. Define weight of an observation.

7. Distinguish between sidereal time and standard time.

8. What is meant by declination?

9. State the principal of EDM.

10. Define tilt displacement.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the method of determining the constants of a tacheometer from field measurements. (8)

(ii) Determine the gradient from a point P to a point Q from the following observations carried out with a tacheometer fitted with an annalatic lens

Instrument station	Staff point	Bearing	Vertical angle	Staff readings
O	P	345°	+ 15°	0.750, 1.435, 2.120
O	Q	75°	+ 10°	0.625, 1.835, 3.050

Assume that the staff is held vertical and that the multiplying constant of the instrument is 100. (8)

Or

(b) (i) Derive the expressions for horizontal and vertical distances by tangential method when both angles measured are those of depression (8)

(ii) The following are the records of a tachometric surveying:

Instrument station	Staff station	Bearing	Vertical angle	Staff readings
A	B	N 30° 30' E	+ 10°	1.250, 1.750, 2,250
B	C	S 40° 0' E	+ 5°	0.950, 1.750, 2.550
C	D	S 45° 0' W	+ 8°	1.550, 2.150, 2.750

Assume that the staff s held vertical multiplying constant of the instrument is 100 and additive constant is zero. Calculate the length and bearing of DA (8)

12. (a) (i) How do you determine the intervisibility of triangulation station. (8)

(ii) In a triangulation survey, the altitude of two proposed stations A and B 100 km apart are 430 m and 710 m respectively. The intervening obstruction is situated at C, 60 km from A and has an elevation of 440m. Assertain if A and B are intervisible, and if necessary find by how much B should be raised so that the line of sight must nowhere be less than 3 m above the surface of the ground. The earths mean radius may be taken as 6400 km and the coefficient of refraction as 0.07. (8)

Or

(b) (i) State the factors to be considered in the selection of base line and also explain with neat sketches how to extend the base line in the field. (8)

(ii) A theodolite was set up at a distance of 250 m from a tower. The angle of elevation to the top of the parapet was 8° 18' while the angle of depression to the foot of the wall was 2° 24'.The staff reading on the B.M having R.L 248.000 with the telescope horizontal was 1 .280m. Find the height of the tower and the RL of the parapet. (8)

13. (a) (i) What is meant by weight of an observation and enumerate laws of weights giving examples. (8)

(ii) The following are the observed values of an angle

Angle	Weight
18°09'18"	2
18°09'19"	3
18°09'20"	2

Determine probable error of observation of weight 3 and that of the weighted arithmetic mean. (8)

Or

(b) (i) Enumerate the principle of least squares as applied to observations of equal weight and to those for which different weights are assigned. (8)

(ii) The following angles were measured at station 'O' so as to close the horizon:

AOB = 83° 42' 28".75 Wt. 3

BOC = 102° 15' 43".26 Wt. 2

COD = 94° 38' 27".22 Wt. 4

DOA = 79° 23' 23".77 Wt. 2

Adjust the angles by the method of differences. (8)

14. (a) Write short note on any FOUR of the following

(i) Sidereal time

(ii) Apparent solar time

(iii) Equation of time

(iv) Convergence of meridian

(v) Right ascension $(4 \times 4 = 16)$

Or

(b) (i) Briefly explain the methods of determination of longitudes (8)

(ii) A star was observed for latitude determination and its corrected latitude is 40° 36' 30" .The declination of the star is 10° 36' 40" and hour angle is 46° 36' 20". Compute the latitude of the place of observation. (8)

15. (a) (i) Derive the parallax equation for determining elevation and ground coordinates of a point. (10)

(ii) A photographic surveying is carried out to a scale of 1:20000. A camera with a wide angle lens off =150 mm was cased with 23 cm × 23 cm plate for a net 60°/o overlap along the flight. Find the error in height given by an error of 0.1 mm in measuring the parallax of the point. (6)

Or

(b) (i) Discuss briefly about various methods of measuring discharges from streams. (12)

(ii) What is the mean sea level and how is it established. (4)
