Reg. No. : | | M E T | E N G G | |

Question Paper Code : 77056

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

Third Semester

Civil Engineering

CE 6304 — SURVEYING – I

(Regulation 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the two basic principles of surveying.

2. What is meant by reconaissance survey?

3. Define : (a) True bearing (b) Magnetic bearing.

4. Write any two advantages of plane table surveying.

5. Name different kinds of bench marks.

6. Differentiate between a level line and a horizontal line.

7. What is contour gradient? Where it is used?

8. How earthwork required is calculated using contours?

9. What is face left and face right?

10. Define tangential tacheometer.

PART B — (5 × 16 = 80 marks)

11. (a) A steel tape 30m long standardized at 10°C with a pull of 10 kg was used for measuring a base line. Find the correction per length, if at the time of measurement the temperature was 22°C and the pull exerted 15 kg weight of steel of density equals 7.75 gm/cm³. Weight of tape is 0.68 kg, $E = 2.11 \times 10^6$ kg/cm² and $\alpha = 12 \times 10^{-6}$ per °C. (16)

Or

(b) A Chain was tested and found exactly 30m before starting a survey. At the end of the chain survey, it was found to be 0.18 meter too long. The survey was for finding the area of a field. The area of this field as drawn to scale of 1 cm = 50 meters was 130 Sq-m. Find correct area of the field? (16)

12. (a) A compass survey was carried out around a closed traverse ABCD and the following readings were obtained :

LINE	F.B	B.B
AB	74°30'	256°10'
BC	107°30'	286°30'
CD	225°10'	45°10'
DA	306°50'	126°10'

Identify the station(s) affected by the local attraction and work out the corrected bearings of the lines. (16)

Or

(b) Find out the station affected by the local attraction and work out the corrected bearings of the lines. The following are the observed bearing of the lines of a traverse ABCDEA with a compass in a place where local attraction was suspected.

LINE	FB	BB
AB	191°45'	39°30'
BC	22°15'	222°30'
CD	22°15'	200°30'
DE	242°45'	62°45'
EA	330°15'	147°45'

Find also the included angles between the lines. (16)

13. (a) Following consecutive staffs reading were taken with a level along a sloping ground line AB at a regular distance of 20 m by using 4 m leveling staff 0.352, 0.787, 1.832, 2.956, 3.758, 0.953, 1.766, 2.738, 3.872, 0.812, 2.325 and 3.137. Rule out a page of level field book, enter the above readings. RL of point A is 320.288 m. Calculate RL of all the points by rise and fall method, and work out the gradient of line AB. (16)

Or

(b) The following reading were taken with a dumpy level (i) when the instrument is midway between two pegs A and B, 100 mts apart. The staff reading on A = 3.345 m. The staff reading on B = 2.025 m (ii) When the instrument is kept very near A. The staff reading on A = 2.950 m. The staff reading on B = 2.000 m. Is the instrument in adjustment or not? When the instrument is very near to A, What should be the correct reading on staff B? (16)

14. (a) An Embankment is to be formed with its center line on the ground sloping upwards at 1 in 20. If the formation width is 12 m and if the formation heights at the beginning, middle and end of the embankment are 6m, 4.5 m and 3 m respectively at intervals of 30 m and the side slope is 2 in 1. Find the volume of earthwork by (i) prismoidal rule, (ii) trapezoidal rule. (16)

Or

(b) The width at formation of a certain road is 10 m and the side slopes of 1 in 1 in cut and 1 in 2 in fill. The original ground has a cross fall of 1 in 4. If the depth of excavations at the centre lines of the two sections 40 m apart are 0.3 m and 0.8 m respectively, find the volumes of cut and fill over this length. (16)

15. (a) A theodolite was setup at a distance of 180m from a light house and the angle of elevation to its top and depression to its base were observed as 22°45' and 1°12' respectively. The reading on a staff held on B.M. of R.L. 175.590 m was 1.85 m with line of collimation horizontal. Calculate

    (i) The height of light house

    (ii) The R.L of top. (16)

Or

(b) (i) A tachometer is set up at an intermediate point on a traverse course PQ and the following observations are made on a vertically held staff.

Staff station	Vertical angle	Staff intercept	Axial hair reading
P	8°36'	2.35	2.105
Q	6°6'	2.055	1.895

The instrument is fitted with an anallatic lens with multiplicative constant 100. Compute the length of PQ and reduced level of Q, if that of P being 321.5 m. (10)

(ii) Two distances of 20 m and 100 m were accurately measured out and the intercepts on the staff between the outer stadia webs were 0.916 m at the former distance and 0.996 m at the later. Calculate the tachometric constant. (6)

3