Total No. of printed pages = 6

CT-404/Surveying-II/4th Sem/2017/N

SURVEYING – II

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

PART – A

1. Choose the correct answer from the given options : 5×1=5

   (i) The radiation method of plane tabling involves

   (a) keeping the plane table at one station

   (b) keeping the plane table on at least two stations

   (c) keeping the plane table at many stations

   (d) obtaining points on the ground by intersection of two lines

(ii) Which of the below is not an advantage of plane table surveying ?

(a) used for accurate works

(b) less costly

(c) field book is not required

(d) rapid method

(iii) When you transit the telescope, you rotate the telescope about

(a) the vertical axis

(b) the trunnion axis

(c) the optical axis of the telescope

(d) the line of collimation

(iv) The horizontal circle in a theodolite is graduated in

(a) the quadrantal system from 0° to 90° in the four quadrants

(b) the whole circle system from 0° to 360°

(c) the semi-circle system from 0° to 180° in the right and left halves

(d) a way similar to that in a prismatic compass

(v) In tacheometry, the distance formula for an inclined line of sight with angle of depression, when the staff is held perpendicular to the line of sight is

(a) $Ks + C - h$

(b) $Ks \cos\theta + C \cos\theta - h$

(c) $Ks \cos\theta + C - h$

(d) $Ks + C \cos\theta - h \sin\theta$

2. State if the following statements are true or false : $5 \times 1 = 5$

(i) By using an anallactic lens in a theodolite the additive constant is made zero.

(ii) The tangential method of tacheometry uses the readings against the top and bottom stadia hairs only.

(iii) An alidade in plane tabling is used for determining distances of objects.

(iv) To change the reading on the theodolite while measuring an angle upper clamp is loosened and lower clamp is tightened.

(v) While taking vertical angle observation, theodolite is levelled with respect to altitude level.

3. Fill in the blanks : 5×1=5

(i) _____ instrument is used to sight an object in plane tabling.

(ii) A line joining the intersection of the cross hairs to the optical centre of the objective and its continuation is called _____.

(iii) The process of setting the theodolite exactly over the station mark is known as _____.

(iv) The process of determining the differences of elevations of stations from observed vertical angles and known distances is called _____.

(v) The distance formula for finding distances using tacheometer, for a horizontal line of sight is _____.

4. Explain the following : 5×2=10

(i) Orientation by backsighting in plane tabling

(ii) Advantages of plane table surveying

(iii) Errors eliminated by repetition method

(iv) Reiteration method

(v) Principle of movable hair method

PART – B

5. Answer the following questions : 5×5=25

(i) What is the principle of stadia method ? Also derive the expression for constants K and C.

(ii) What is parallax ? How will you eliminate parallax in theodolite ?

(iii) With a neat diagram explain plane table surveying by intersection method.

(iv) Explain the various sources of errors in plane table surveying.

(v) Explain the fundamental lines of theodolite and give their desired relations.

6. A tacheometer was kept at a station P and observations were made to a staff held vertically at Q. The cross hair readings were 1.835, 1.920 and 3.755. The vertical angle of depression was 8°06′. From the same set-up, the reading on a staff held at a B.M of R.L 962.55 was 2.035 m. Find the horizontal distance PQ and the R.L of point Q. K= 100, C=0. 5

7. Two stations A and B were used to measure the height of an object P, the stations do not lie in the same vertical plane as the object. The distance between the stations was 250 m and the vertical angles observed to the object were 10°30′ from A and 6°45′ from B. The horizontal ∠PAB was 82°30′ and ∠ PBA was 38°40′. The staff readings on a benchmark of R.L 2345.5 m were 2.35 m and 1.85 m from A and B, respectively. Find the R.L of station P if the readings were to a mark 4 m above the point P. 5

8. Derive the distance and elevation formulae for stadia method when the line of sight is inclined at an angle of elevation and the staff is held vertical. 10