Total No. of printed pages = 6

CT-302/Surveying-I/3rd Sem/2017/N

SURVEYING – I

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 : $5 \times 1 = 5$

   (i) Which of the below is not a temporary adjustment of prismatic compass ?

   (a) Centring

   (b) Levelling

   (c) Focussing prism

   (d) Adjusting sight vane

[Turn over

(ii) A metallic tape is made of

(a) steel

(b) invar

(c) cloth interwoven with metallic fibres

(d) a composite material of steel and brass

(iii) A 30 m chain was used to measure a line AB which was found to be 205 metres long. If the chain was found to be 2 cm too long, then the actual length of the line AB is

(a) 203.86 m

(b) 204.86 m

(c) 205.13 m

(d) 206 m

(iv) Balancing the sight lengths for backsights and foresights is done to eliminate the error due to

(a) faulty staff

(b) curvature and refraction

(c) faulty centring of level

(d) small inclination of line of sight

(v) If the measured distance along the slope is 18.5 m and the gradient is 1:16, then the horizontal distance is

(a) 18.5 m

(b) 18.46 m

(c) 17.9 m

(d) 16 m

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

(i) Correction due to sag of a tape is always negative.

(ii) Prismatic compass is based on reduced bearing system.

(iii) The horizontal angle between the true meridian and magnetic meridian at a place is called declination.

(iv) Local attraction in compass surveying may exist due to loss of magnetism of the needle.

(v) A negative reading in the levelling data means the staff is read with the lower cross hair.

3. Fill in the blanks : $5 \times 1 = 5$

(i) _____ bearing is measured in the direction of survey.

(ii) A relatively permanent point of reference whose reduced level is known is called _____.

(iii) A levelling staff which can be read directly by the instrument man through the telescope is called _____.

(iv) Contour lines of different elevations can unite to form one line only in the case of a _____.

(v) The horizontal distance between two points on two consecutive contours is known as _____ and depends upon the _____ of the ground.

4. Define the following : $5 \times 2 = 10$

(i) Contour gradient

(ii) Line of collimation

(iii) Magnetic meridian

(iv) Direct levelling

(v) Geodetic surveying.

PART – B

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

   (i) What is temporary adjustment ? Explain the steps involved in temporary adjustment of a level.

   (ii) Explain the use of contour map for drawing of sections along any given direction to determine the general shape of the ground.

   (iii) With a neat diagram explain any one method of chaining on uneven ground.

   (iv) What is reciprocal levelling ? Derive the expression for true difference in elevations of two points by reciprocal levelling.

   (v) Explain the differences between a prismatic compass and surveyor's compass.

6. The whole circle bearings of the lines of a closed traverse are given below. Determine which stations are affected by local attraction and correct the bearings by calculating the included angles. 10

Lines	Forebearings	Backbearings
AB	41°20′	221°20′
BC	114°30′	293°50′
CD	164°40′	364°20′
DA	275°30′	94°30′

7. The following consecutive readings were taken with a level : 10

6.34, 5.10, 6.32, 8.14, 9.71, 6.62, 7.93, 8.59, 9.96, 10.23

The level was shifted after 4th, 6th and 9th readings. The R.L of the first point was 251.462 m.

(a) Enter the readings in a level field book-form and reduce the levels by rise and fall method.

(b) Apply the usual arithmetic check.

(c) Determine the difference in elevation between first and last point.