Total No. of printed pages = 8
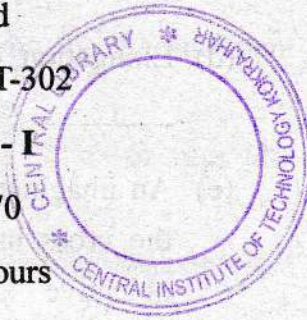
# END SEMESTER EXAMINATION – 2019

Semester : 3rd

Subject Code : CT-302

## SURVEYING - I

Full Marks –70

Time – Three hours

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

**Instructions :**

1. *All* questions of PART – A are compulsory.

2. Answer any *five* questions from PART – B.

## PART – A

### Marks – 25

1. Fill in the blanks :                    1×10=10

   (a) When the earth surface is considered as plane
   surface, the survey is classified as _____ .

   (b) The type of survey which deals with the
   measurement of boundary lines and transfer
   of land ownership is called _____ survey.

[Turn over

(c) _____ survey is one of the basic and convenient method of making a linear measurements.

(d) Elongation of chain length is a source of _____ error.

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

(f) Full form of WCB in compass survey is _____.

(g) The sum of R.L. of B.M. and backsight reading taken on B.M. is equal to _____.

(h) Prismatic compass gives the bearing of a line in _____ system.

(i) The R.L. of two points across a river can be determined by method of _____.

(j) The vertical distance between two consecutive contour lines is called _____.

2. Write true or false :                     1×10=10

(a) Engineer's chain comes with a length of 100 ft.

(b) Geodetic survey deals with the measurement of line using a tape.

(c) Invar tape is accurate due to its low coefficient of expansion.

(d) Surveyor's compass gives the bearing of a line in whole circle bearing system.

(e) The angle between the meridian and the line joining object and instrument is called bearing of the line.

(f) Two contour lines can cross each other in case of cave or overhanging cliff.

(g) The horizontal distance between two consecutive contour lines is always constant.

(h) In levelling, a station is the point where a levelling staff is kept.

(i) Differential levelling is used to transfer the R.L. of a benchmark to another point at some distance apart.

(j) The difference between true bearing and magnetic bearing is called declination.

3. Choose the correct answer:      1×5=5

(a) If the reduced bearing of a line is N 57° 45′ 30″ W, its whole circle bearing is

   (i) 302° 45′ 3″      (ii) 302° 4′ 30″

   (iii) 302° 14′ 30″      (iv) 302° 41′ 30″

(b) The magnetic bearing of a line is 52° 46′, what is the true bearing if the magnetic declination is 5° 28′ west ?

   (i) 47° 18′ 20″      (ii) 45° 16′ 10″

   (iii) 47° 18′ 00″      (iv) 45° 18′ 00″

(c) A 30m chain was used to measure a line AB which was found to be 205 metres long. The actual length of the line AB was 205.14m. What was the error in the chain ?

   (i) 1 cm      (ii) 2 cm

   (ii) 3 cm      (iv) 4 cm

(d) A reading is taken on a staff held on a B.M. The staff reading is recorded as 1.234m and height of instrument is 123.456m. What is the elevation of B.M ?

   (i) 123.22m      (ii) 122.23m

   (iii) 122.22m      (iv) 123.32m

(e) The magnetic bearing of a line is

   (i) The horizontal angle between any line

   (ii) The vertical angle of a line from the horizontal plane

   (iii) The horizontal angle between the magnetic meridian and the line

   (iv) The vertical angle between the magnetic meridian and the line.

## PART – B

### Marks – 45

4. (a) Define the following :      2×2=4

   (i) Contour gradient

   (ii) Contour line

  (b) What is temporary adjustment ? Explain the steps involved in temporary adjustment of a level.      5

5. (a) Define the following :      2×2=4

   (i) Reciprocal levelling

   (ii) Topographical survey

(b) In a closed traverse, the fore bearings of the lines AB, BC, CD and DA are 45°22', 122°34', 210°28' and 285°68' respectively. Find the included angles A, B, C and D. 5

6. (a) Define the following : 2×2=4

    (i) Magnetic meridian

    (ii) Levelling

(b) In levelling between two points A and B on opposite banks of a river, the level was set up near A, and the staff readings on A and B were 1.266m and 2.874m respectively. The level was then moved and set up near B and the respective readings on A and B were 0.785m and 2.356m. What is the true difference of level between A and B ? 5

7. (a) In a closed traverse, the fore bearings of the lines AB, BC, CD and DA are 45°36', 124°25', 210°32' and 285°55' respectively. Find the included angles A, B, C and D. 5

(b) Define the following : 2×2=4

    (i) Reduced bearing

    (ii) Cumulative error

8. (a) Explain five characteristics of contours. 5

(b) Define : 2×2=4

    (i) Indirect levelling

    (ii) Compensating error

9. The whole circle bearings of the lines of a closed traverse are given below. Calculate the included angles and check for any observational and instrumental error. Considering the bearings of line AB to be correct, compute the correct bearings of other lines. 9

| Lines | Forebearings | Backbearings |
| --- | --- | --- |
| AB | 42°20' | 223°20' |
| BC | 118°30' | 293°50' |
| CD | 156°40' | 364°20' |
| DA | 256°30' | 74°30' |

10. The following consecutive readings were taken with a level :  9

6.34, 5.16, 5.22, 8.18, 9.82, 6.74, 7.93, 8.60, 9.92, 10.20

The level was shifted after 3rd, 5th and 9th readings. The R.L of the first point was 123.456m.

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

(b) Apply the arithmetic check.