

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2018

**SURVEYING - II**

[Time : 3 hours

(Maximum marks : 100)

**PART — A**

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Name any four fundamental lines of a theodolite.
2. Write the transit rule to balance a traverse.
3. State on additive and multiplying constants of a tacheometer.
4. What is mid ordinate of a curve ?
5. State the principle behind the distance measurement using a total station. (5 × 2 = 10)

**PART — B**

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. Write the procedure for prolonging a line by Double sight method.
2. State on the following :
  - (a) Transitting
  - (b) Swinging
  - (c) Face left
  - (d) Face right operations of a theodolite.
3. Define and write the relation for latitude and departure of a line.
4. What is repetition method ? State any 3 errors eliminated by this method.
5. Obtain the horizontal and vertical distance relations in tangential tacheometry, when both angles are depression angles.
6. Write all the functional relations for the geometrics of a simple curve.
7. State shortly on the following methods of map projection.
  - (a) Equal area projection
  - (b) Conformal projection
  - (c) Equidistant projection(5 × 6 = 30)

## PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

## UNIT — I

- III (a) Explain the procedure for measuring a deflection angle. 7
- (b) Enumerate the steps involved in temporary adjustment and permanent adjustment of a transit theodolite. 8

OR

- IV (a) Write the permanent adjustment procedure for making the line of sight perpendicular to the horizontal axis of theodolite. 9
- (b) How the least count of a theodolite can be obtained? 6

## UNIT — II

- V (a) A traverse is run to setout a line  $MQ = 1900$  m at right angles to a given line  $MN$ . The lengths and bearings are as follows :

Line	Length (m)	Bearing
MN	-	$360^{\circ}00'$
MO	850	$120^{\circ}00'$
OP	1000	$86^{\circ}30'$
PQ	-	-

Calculate the length and bearing of line PQ. 10

- (b) A man travels from a point 'A' due west and reaches a point B. The distance between the points A and B is 139.6 M. Calculate the latitude and departure of the line AB. 5

OR

- VI (a) The following are the consecutive co-ordinates in respect of a closed theodolite traverse ABCDA.

Station	Northing	Southing	Easting	Westing
A	300.75	-	-	200.50
B	200.25	-	299.25	-
C	-	299.00	199.75	-
D	-	200.00	-	300.50

- Calculate :
1. The magnitude and direction of closing error.
  2. Corrected consecutive co-ordinates of station B. Use transit rule.
  3. Independent co-ordinates of station B, if those of A are (100,100) 10

- (b) In a quadrilateral ABCD, the co-ordinates of the points are as follows.

Point	Easting	Northing
A	0	0
B	0	-893.8
C	634.8	728.8
D	1068.4	699.3

Find the area of the figure.

5

UNIT — III

- VII (a) A tacheometer fitted with an anallatic lens was set up at a station A and the following readings were obtained on a vertically held staff.

Station	Staff station	Vertical angle	Hair readings
A	BM	$-2^{\circ} 18'$	1.500, 1.800, 2.450
A	B	$+8^{\circ} 36'$	0.750, 1.500, 2.250

The RL of the BM was 100. Calculate the horizontal distance AB and the RL of B.

10

- (b) A vane 3.0m above the foot of a staff was sighted from a point 3000m away from it. The observed angle of elevation was  $2^{\circ} 30'$ . The reduced level of the trunion axis being 200m. Find the reduced level of the staff-station. Neglect correction for curvature and refraction.

5

OR

- VIII The following readings were taken on a vertical staff with a tacheometer fitted with an anallatic lens, and having a constant of 100. Find the gradient of AB.

Staff	Bearing	Stadia reading	Vertical angle
A	$47^{\circ} 30'$	0.95, 1.500, 2.050	$+10^{\circ} 20'$
B	$237^{\circ} 30'$	0.845, 2.100, 3.150	$-5^{\circ} 30'$

15

UNIT — IV

- IX (a) Write the field procedure to set out a curve by Rankine's method of deflection angles - one theodolite method.
- (b) What are the components of a GPS receiver ?

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OR

- X (a) Two straight lines AI and BI intersect at an inaccessible point I. Two points P and Q are selected on lines AI and BI respectively. Length of PQ = 180m,  $\angle APQ = 110^{\circ}$  and  $\angle PQB = 130^{\circ}$ . The two straight lines are to be joined by a curve of 500m radius. Chainage of point P is 2500.00. Calculate the necessary data for setting the curve.
- (b) What is a Distomat ? Name any 4 models of a Distomat.

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