

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE, NOVEMBER – 2023**

**SURVEYING - I**

[Maximum Marks: **100**]

[Time: **3 Hours**]

**PART-A**

[Maximum Marks: **10**]

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

1. Differentiate between plane surveying and geodetic surveying.
2. Differentiate between true meridian and magnetic meridian.
3. Define level surface.
4. Differentiate between contour interval and horizontal equivalent.
5. List principle lines of dumpy level.

(5 x 2 = 10)

**PART-B**

[Maximum Marks: **30**]

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

1. Explain the fundamental principles of surveying.
2. The length of survey line was measured with a 20 m chain and was found to be equal to 1200 metres. As a check length was again measured with a 25 m chain and was found to be 1212 m. On comparing the 20 m chain with the test gauge it was found to be 1 decimetre too long. Find the actual length of 25 m chain used.
3. Differentiate between magnetic dip and declination.
4. Convert the following whole circle bearings to quadrantal bearings.  

i) 22°30'	ii) 170°12'
iii) 211°54'	iv) 327°24'
5. Calculate the correction for curvature and refraction for a distance of  

i) 1200 m	ii) 2.48 km
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6. Define the terms.  

i) Height of instrument	
ii) Back sight	iii) Foresight
7. Explain the uses of contour.

(5 x 6 = 30)

**PART-C**

[Maximum Marks: 60]

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

**UNIT – I**

- III. a. List the conditions to be fulfilled by survey lines or survey stations. (7)
- b. In passing an obstacle in the form of a pond, stations A and D, on the main line were taken on the opposite sides of the pond. On the left of AD, a line AB, 200 m long was laid down and a second line AC, 250 m long was ranged on the right of AD, the points B, D and C being in the same straight line. BD and DC were then chained and found to be 125 m and 150 m respectively. Find the length of AD. (8)

**OR**

- IV. a. Explain the procedure of traversing in plane table survey. (7)
- b. Plot the following cross staff survey of a field and calculate its area. (8)

	100	
F45	75	
	60	40C
E30	50	
	20	30B
	0	

**UNIT – II**

- V. a. Explain the variations in declination. (7)
- b. The following bearings were observed while traversing with a compass.

Line	F.B	B.B
AB	45°45'	226°10'
BC	96°55'	277°5'
CD	29°45'	209°10'
DE	324°48'	144°48'

Mention which stations were affected by local attraction and determine the corrected bearings. (8)

**OR**

- VI. a. The following are observed fore bearing of a line. Find their back bearing. (7)
- i) AB 12°24'                      ii) BC 119°48'
- iii) CD 266°30'                    iv) DE 354°18'

b. The following are bearings taken on a closed compass traverse.

Line	F.B	B.B
AB	80°10'	259°0'
BC	120°20'	301°50'
CD	170°50'	350°50'
DE	230°10'	49°30'
EA	310°20'	130°15'

Compute the interior angles and correct them for observational errors. (8)

### UNIT- III

VII. a. Explain the temporary adjustments of a level. (7)

b. The following consecutive readings were taken with a dumpy level.

1.895, 1.500, 1.865, 2.570, 2.990,  
2.020, 2.410, 2.520, 2.960, 3.115

The level was shifted after fourth, sixth and eighth readings. The R.L of the first point was 30.500. Rule out a page as a level book and fill all columns using collimation method and apply the usual checks. Indicate highest and lowest points. (8)

**OR**

VIII. a. Sketch and identify the parts of a dumpy level. (7)

b. The following consecutive readings were taken with a dumpy level on a continuously sloping ground.

3.480, 2.695, 1.440, 0.855, 2.115,  
1.640, 3.465, 2.110, 1.110, 0.655

The first reading was on B.M of reduced level 550m. Prepare a page of level field book and enter the above readings in correct form and calculate the reduced level of remaining points by rise and fall method. (8)

### UNIT - IV

IX. a. The following notes refer to reciprocal levels taken with one level.

Instrument at	Staff readings on		Remarks
	P	Q	
P	1.824	2.748	Distance PQ = 1010 m
Q	0.928	1.606	R.L of P = 126.386

Find i) True R.L of Q.

ii) Combined correction for curvature and refraction.

iii) Collimation error

(7)

b. In running fly levels from a bench mark of R.L 360.50, the following readings were observed.

Back sight 0.965, 1.630, 1.105, 0.850, 0.395

Foresight 0.945, 1.150, 1.985, 1.125

From the last position of the instrument seven pegs at 10 m intervals are to be set out on a uniform gradient of 1 in 40. The first peg is to have a R.L of 360.00. Work out the staff readings required for setting the top of pegs on given gradient and enter the results in a level book form. (8)

**OR**

X. a. Explain the characteristics of contour. (7)

b. The areas with contour lines at the site of a reservoir, angle along the face of the proposed dam area as follows.

SI no	Contour	Area in square meter
1	612	2745
2	610	2725
3	608	1885
4	606	1800
5	604	1805
6	602	1795
7	600	1835

Determine the volume of water in cu.m taking 600 as the bed level and when the reservoir is full by

i) Trapezoidal rule      ii) Prismoidal rule (8)

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