

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/  
COMMERCIAL PRACTICE, NOVEMBER - 2024**

**SURVEYING - I**

[Maximum marks: 100]

[Time: 3 Hours]

**PART – A  
Maximum marks: 10**

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

1. State the two basic principles of surveying.
2. List the different types of chains used in surveying.
3. Define the following (a) Closing error (b) Magnetic Declination
4. List the major parts of a dumpy level.
5. Define interpolation of contour.

(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 different operations involved in chain surveying.
2. Describe the radiation method of plane table surveying.
3. Calculate the true bearings of the lines from the following magnetic bearing and declination.

| Line | Magnetic Bearing     | Declination       |
|------|----------------------|-------------------|
| PQ   | $56^{\circ} 21'$     | $3^{\circ} 10' E$ |
| RS   | $S 12^{\circ} 10' W$ | $2^{\circ} 4' W$  |

4. Describe benchmark and its types used in levelling.
5. Identify the important axis of a dumpy level and their relations.
6. Define the following (a) Contour (b) Contour interval (c) Horizontal equivalent
7. Determine the correction for curvature, correction for refraction and combined correction for curvature and refraction for a distance of 3400 m.

(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) Identify the various obstructions encountered in chaining and methods to overcome the same with the help of examples. (9)
- (b) Bring out the difference between base line, check line and tie line with the aid of neat sketch. (6)

**OR**

- IV.** (a) Plot the following cross staff survey of the field ABCDEF and calculate its area.

|      |    |      |
|------|----|------|
|      | 96 | D    |
| E 90 | 70 |      |
|      | 40 | 40 C |
| F 50 | 24 |      |
|      | 12 | 40 B |
|      | 0  | A    |

- (9)
- (b) Explain the intersection method of plane table surveying with the help of a neat sketch. (6)

**UNIT - II**

- V.** (a) The following fore bearing and back bearing were observed in running a closed traverse with a compass.

| Line | Fore bearing | Back bearing |
|------|--------------|--------------|
| PQ   | 44° 30'      | 226° 30'     |
| QR   | 124° 30'     | 303° 15'     |
| RS   | 181° 00'     | 1° 00'       |
| SP   | 289° 30'     | 108° 45'     |

- Determine stations where local attraction is suspected and also calculate the corrected bearings. (9)
- (b) Identify the major parts of a prismatic compass and their functions. (6)

**OR**

**VI.** (a) The following are bearings taken on a closed compass traverse ABCDEA.

| Line | Fore bearing | Back bearing |
|------|--------------|--------------|
| AB   | 55° 00'      | 234° 00'     |
| BC   | 112° 30'     | 294° 00'     |
| CD   | 205° 00'     | 25° 00'      |
| DE   | 257° 00'     | 75° 30'      |
| EA   | 295° 30'     | 116° 30'     |

Test and correct the values of bearing for local attraction. (9)

(b) Explain the concept of meridian and the types of meridian. (6)

**UNIT – III**

**VII.** (a) The following readings are taken on a level instrument with the station A as benchmark with R.L 135.750 m. The instrument is shifted after the 3<sup>rd</sup>, 6<sup>th</sup> and 8<sup>th</sup> reading.

Readings are 2.225, 1.605, 0.995, 2.090, 2.865, 1.265, 0.600, 1.985, 1.045 and 2.685. Enter the above readings in a page of level field book and calculate the reduced levels of all points. (9)

(b) Explain the various types of levelling staff used in levelling. (6)

**OR**

**VIII.** (a) The following readings are taken successively with levelling instrument with station A as benchmark with R.L 50.000m. The staff readings at 3<sup>rd</sup> and 4<sup>th</sup> are inverted and after fifth reading the instrument is shifted.

Readings are 1.820, 2.150, 1.230, 1.460, 0.905, 2.345, 1.995 and 1.860. Calculate reduced level of all other points. (9)

(b) Detail the temporary adjustments of a dumpy level. (6)

**UNIT – IV**

**IX.** (a) Define longitudinal sectioning and explain the field procedure involved in profile levelling. (9)

(b) Summarize the main characteristics of contour lines. (6)

**OR**

**X.** (a) Explain in detail about the method of cross sectioning. (9)

(b) Summarize the following

(i) factors affecting selection of contour interval

(ii) Uses of a contour map. (6)