



B.Tech III Semester Regular/Supplementary Examinations, December 2025

SURVEYING
(CE)

Maximum Marks: 60

Date:22.12.2025

Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

| All the following questions carry equal marks | | (10X1M=10 Marks) | Marks | CO | BTL |
|---|---|------------------|-------|----|-----|
| 1.a) | Name any one principle of surveying. | | 1M | 1 | L1 |
| b) | What is sag correction? | | 1M | 1 | L1 |
| c) | Define reduced level (R.L). | | 1M | 2 | L1 |
| d) | What is the least count of a levelling staff? | | 1M | 2 | L1 |
| e) | What is a transit theodolite? | | 1M | 3 | L1 |
| f) | What is the repetition method? | | 1M | 3 | L1 |
| g) | What is stadia interval? | | 1M | 4 | L1 |
| h) | What method is commonly used for setting out simple curves? | | 1M | 4 | L1 |
| i) | What is the typical least count of a Total Station? | | 1M | 5 | L1 |
| j) | What is the function of a prism in EDM? | | 1M | 5 | L1 |

Part-B

| Answer All the following questions. | | (5X10M=50Marks) | Marks | CO | BTL |
|-------------------------------------|---|-----------------|-------|----|-----|
| 2 | a) Describe the classification of surveying based on (i) Nature of field (ii) Instrument used (iii) Purpose. | | 5M | 1 | L2 |
| | b) What is magnetic declination? Explain its types, causes, and methods for determining it. | | 5M | | L3 |
| OR | | | | | |
| 3 | a) Explain ranging. Describe the methods of direct ranging and indirect ranging with diagrams. | | 5M | 1 | L2 |
| | b) Explain bearings. Differentiate between WCB and QB systems with examples and sketches. | | 5M | 1 | L3 |
| 4 | Explain the effects of curvature of Earth and atmospheric refraction in levelling. Derive the correction formula for both. | | 10M | 2 | L3 |
| OR | | | | | |
| 5 | Explain the characteristics of contours with neat sketches. Describe how contours indicate hills, valleys, ridges, depressions, and slopes. | | 10M | 2 | L3 |

| | | | | |
|----|---|-----|---|----|
| 6 | What are the fundamental lines of a theodolite? Explain the conditions for their permanent adjustments with neat sketches. | 10M | 3 | L3 |
| OR | | | | |
| 7 | At a station P , the vertical angle to the top of a tower T is measured as +10° 50' . The staff held at the base shows the following readings through the telescope: Top wire = 2.555 m Middle wire = 2.355 m Bottom wire = 2.155 m Horizontal distance between instrument and staff = 120 m . Calculate: (a) Staff intercept (b) Vertical distance between instrument axis and top of tower (c) Height of tower if instrument height = 1.50 m and staff held vertically. | 10M | 3 | L3 |
| 8 | Explain the principles of tacheometry. Discuss the role of the stadia diaphragm, constants, and staff intercept in detail. | 10M | 4 | L3 |
| OR | | | | |
| 9 | Derive formulas for all geometric elements of a simple circular curve. Include a well-labeled sketch. | 10M | 4 | L3 |
| 10 | Discuss the principle of EDM instruments. Explain the working of Infrared EDM, Visible Light EDM and Microwave EDM with neat diagrams. Highlight their ranges, accuracy levels, and common sources of errors. | 10M | 5 | L3 |
| OR | | | | |
| 11 | Explain GPS observations in detail. Describe the different methods of GPS surveying. | 10M | 5 | L3 |