# R.N.G.PATEL INSTITUTE OF TECHNOLOGY-RNGPIT
## *(An Autonomous Institute U/s UGC Act 1956)*

### B.Tech. SEMESTER-II, SEMESTER END EXAMINATION – WINTER 2025

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| **SUBJECT CODE: 1CV201** | **DATE: 09-01-2026** |
| **SUBJECT NAME: BASIC SURVEYING** | |
| **TIME: 11:00 AM to 01:30 PM** | **TOTAL MARKS: 70** |

**Instructions**
1. It is **compulsory** for students to write **Enrolment No. /Seat No.** on the question paper.
2. Write answers of **Section A** and **Section B** in **separate answer books**.
3. Attempt all questions from both **Section A** and **Section B**.
4. Each section carries **35 marks**, with a total of **70 marks** for the examination.
5. The figures to the right of each question indicate full marks, make suitable assumptions with justification.
6. BL - Bloom's Taxonomy Levels (R-Remember, U-Understanding, A –Application, N –Analyze, E – Evaluate, C -Create), CO - Course Outcomes.

## SECTION A

| | | | Marks | BL | CO |
|---|---|---|---|---|---|

**Q.1 Multiple-Choice Questions** [05]

**(a)** In order to measure the magnetic bearing of a line, the theodolite should be provided with _____      **1   R   3**

    **(i)** extra telescope          **(ii)** spirit level

    **(iii)** compass          **(iv)** tabular or trough compass

**(b)** To run a straight line between two points, when both ends are inter visible, We establish intermediate points through _____      **1   R   3**

    **(i)** line of sight          **(ii)** balancing

    **(iii)** using random line          **(iv)** back sight

**(c)** After setting up the instrument first thing done by the surveyor is_____      **1   R   3**

    **(i)** releasing all clamps          **(ii)** levelling instrument

    **(iii)** turning plates          **(iv)** clamping the plates

**(d)** Error due to in accurate centering comes under _____ error.      **1   R   5**

    **(i)** personal          **(ii)** natural

    **(iii)** instrumental          **(iv)** personal and natural

**(e)** Error due to imperfections due to wear comes under _____ error.  1  R  5

    **(i)** personal                  **(ii)** natural

    **(iii)** instrumental          **(iv)** personal and natural

**Q.2 Attempt Any Two**  [10]

**(a)** Differentiate fixed hair method and movable hair method.  5  R  3

**(b)** Derive the expression for horizontal and vertical distances, in the fixed hair method when the staff is held vertically and the measured angle is that of elevation.  5  N  3

**(c)** Explain in detail field procedure of tacheometric survey work.  5  A  3

**Q.3 Attempt Any Two**  [10]

**(a)** Explain the procedure of indirect levelling on a steep slope.  5  A  3

**(b)** What is trigonometric levelling what are its advantages and disadvantages over direct levelling?  5  U  3

**(c)** In trigonometric levelling base of the object is inaccessible, instrument stations in the same vertical plane as object and height of instrument axis at the same level. Derive an equation to find RL of the object.  5  N  3

**Q.4 Attempt Any Two**  [10]

**(a)** Explain Laws of Weights.  5  U  5

**(b)** Elaborate theory of least squares.  5  A  5

**(c)** The following are the angles observed at a triangular traverse along with their probable errors. Determine correct values of angle.
$\llcorner A = 64°10'12'' \pm 02''$, $\llcorner B = 50° *15'30'' \pm 04''$, $\llcorner C = 64°12'08'' \pm 05''$  5  N  5

**Marks BL CO**

**Q.5 Multiple-Choice Questions** **[05]**

**(a)** Which of the following is the first principle of surveying? **1 R 1**

   **(i)** Whole to whole             **(ii)** Part to part

   **(iii)** Part to whole            **(iv)** Whole to part

**(b)** In which of the following type of surveying only linear measurements are made? **1 R 1**

   **(i)** Dumpy level             **(ii)** Theodolite surveying

   **(iii)** Chain surveying           **(iv)** Contouring

**(c)** In which of the following areas does compass surveying is not recommended? **1 R 1**

   **(i)** Large areas             **(ii)** Undulating areas

   **(iii)** Crowded with many details      **(iv)** Local attraction suspected areas

**(d)** Which of the following is not required for chain surveying? **1 R 1**

   **(i)** Dumpy level             **(ii)** Pegs

   **(iii)** Arrows                **(iv)** 20 m chain

**(e)** Which of the following is not a method of leveling? **1 R 1**

   **(i)** Spirit leveling            **(ii)** Traverse leveling

   **(iii)** Barometric leveling        **(iv)** Trigonometric leveling

**Q.6 Attempt Any Two** **[10]**

**(a)** Define meridian. Explain various types of Meridians and Bearings. **5 U 1**

**(b)** What do you mean by traversing? Enlist and explain various types of compass. **5 U 1**

**(c)** The following bearings were taken on a closed traverse ABCDEA find out which stations are affected by local attraction and calculate correct bearing and included angles. Also apply necessary checks. **5 E 1**

| Side | F.B | B.B |
|------|------|------|
| AB | 68° 00 ' | 248° 00 ' |
| BC | 138° 00 ' | 319° 00 ' |
| CD | 193° 00 ' | 13° 30 ' |
| DE | 302° 30 ' | 123° 30 ' |
| EA | 17° 00 ' | 194° 30 ' |

**Q.7 Attempt Any Two** [10]

    **(a)** Explain trapezoidal formula and prismoidal formula to compute area and volume.     **5   N   4**

    **(b)** Explain the construction and working of the planimeter with a neat sketch.     **5   N   4**

    **(c)** An embedment of which 12.20 m and side slope 1.5: 1 is required to be made on a ground which is in direction transvers to the centre line. The centre height at 42 m interval is as follows: 1.02, 123, 2.35, 1.87, 1.33 and 0.97. Calculate the volume of earthwork according to trapezoidal and Simpsons rule.     **5   E   4**

**Q.8 Attempt Any Two** [10]

    **(a)** Give advantage and disadvantage of plane table survey.     **5   R   2**

    **(b)** Explain the principal of plane tabling and procedure of setting up of it.     **5   A   2**

    **(c)** List out and explain the various instruments used in plan tabling with neat sketch.     **5   U   2**

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