

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

B.Tech. SEMESTER-III, SEMESTER END EXAMINATION – WINTER 2025

SUBJECT CODE: 1CV302

DATE: 18-12-2025

SUBJECT NAME: ADVANCED 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 - Cognitive Level (As per Revised Bloom's Taxonomy) (R-Remember, U-Understanding, A –Application, N –Analyze, E – Evaluate, C -Create), CO - Course Outcomes.

SECTION A

	Marks	BL	CO
Q.1 (a) Define the following terms: Azimuth, Latitude, Longitude	03	R	3
(b) Explain the significance of azimuth, latitude, and longitude in geodetic surveying.	04	U	3
Q.2 (a) Explain triangulation in detail.	03	U	2
(b) What are the different selection criteria of triangulation stations?	04	U	2
(c) Find out minimum height of signal required at B so that the line of sight may not pass near the ground than 1.5 m, if A and B two stations are 50 km apart and have elevations 250 m and 230 m respectively. Ground may be assumed to have uniform level of 200 m.	07	E	2
OR			
Q.2 (a) Give the difference between plane surveying and geodetic surveying.	03	U	2
(b) What are the different selection criteria for baseline?	04	U	2
(c) Two triangulation stations A and B are 60 km apart and have elevations 240 m and 280 m respectively. Find the minimum height of signal required at B so that the line of sight may not pass near the ground than 2 m. The intervening ground may be assumed to have a uniform elevations of 200 m.	07	E	2
Q.3 (a) Define the following terms: (i) Deflection angle (ii) Long Chord (iii) Length of the curve	03	R	6
(b) Write a short note on vertical curves.	04	U	6
(c) Explain the classification of curve in detail.	07	U	6

OR

Q.3	(a) List out the methods of the setting out the simple circular curve and describe any one method in brief.	03	R	6
	(b) Write a short note on transition curves.	04	U	6
	(c) What is super elevation? What is the main purpose of providing a super elevation? Derive the equation for super elevation.	07	N	6

SECTION B

		Marks	BL	CO
Q.4	(a) Define Total Station.	03	R	5
	(b) Explain the principle of Electronic Distance Measurement (EDM) with a simple diagram.	04	U	5
Q.5	(a) Define Tacheometry and state its purpose.	03	R	1
	(b) What are the sources of error in tacheometric surveying?	04	U	1
	(c) A tacheometer with stadia constants $K=100K$ and $C=0$ is set up and an inclined sight is taken to a staff held at a distant point. The staff readings are: upper hair = 3.050, middle hair = 2.100 m, lower hair = 1.150. The vertical angle measured from the horizontal up to the line of sight is $\theta=+2.5^\circ$. Compute (i) the horizontal distance between the instrument vertical axis and the staff base, and (ii) the vertical rise of the staff point above the instrument axis. Give answers to two decimal places.	07	A	1

OR

Q.5	(a) What are stadia constants?	03	R	1
	(b) What are the main instruments used in tacheometric surveying?	04	U	1
	(c) A tacheometer has multiplying constant $K=100$ and additive constant $C=1.5$ without an analytic lens. When an analytic lens is fitted, the additive constant becomes effectively zero (i.e. $C=0$). For a staff intercept $s=1.60$ m and vertical angle $\theta=5^\circ$, compute the horizontal distances (a) without analytic lens and (b) with analytic lens. Comment briefly on the effect.	07	A	1
Q.6	(a) Define Geographical Information System (GIS).	03	R	6
	(b) Differentiate between active and passive remote sensing systems with examples.	04	U	6
	(c) Discuss the integration of Remote Sensing and GIS with applications in Civil Engineering.	07	A	6

OR

Q.6	(a) Write applications of remote sensing in civil engineering.	03	R	6
	(b) Explain the principles of energy interaction with the atmosphere and earth surface features.	04	U	6
	(c) Explain the key components and functions of GIS.	07	A	6
