

ANURAG Engineering College
(An Autonomous Institution)

II B.Tech I Semester Supplementary Examinations, December-2024

SURVEYING & GEOMATICS
(CIVIL ENGINEERING)

Time: 3 Hours

Max. Marks: 75

Section – A (Short Answer type questions)**(25 Marks)****Answer All Questions**

	Course Outcome	B.T Level	Marks
1. What are the general principles of surveying?	CO1	L2	2M
2. Compare Whole Circle Bearing and Quadrantal Bearing?	CO1	L2	3M
3. What are the temporary adjustments of a levelling instrument?	CO2	L2	2M
4. List out any three characteristics of contours?	CO2	L1	3M
5. List out various types of theodolites used in surveying?	CO3	L1	2M
6. What are the applications of trigonometrical levelling?	CO3	L2	3M
7. Give the reasons for preferring a parabola for vertical curves	CO4	L1	2M
8. State the elements of reserve curve with a sketch labeled with component parts	CO4	L1	3M
9. Define photogrammetry	CO5	L1	2M
10. Illustrate crab and drift in photogrammetry surveying	CO5	L2	3M

Section B (Essay Questions)**Answer all questions, each question carries equal marks.****(5 X 10M = 50M)**

11. A) In a closed traverse ABCDE, the bearing of line AB was measured as $150^{\circ} 30'$. The included angles were measured as $130^{\circ} 10'$, $89^{\circ} 45'$, $125^{\circ} 22'$, $135^{\circ} 34'$ and $59^{\circ} 9'$ at stations A, B, C, D and E respectively. Calculate Bearings of all other lines.
- OR**
- B) The following fore and back bearings were observed in an open traverse
- | Line | F.B. | B.B |
|------|-------------------|-------------------|
| 1-2 | $002^{\circ} 15'$ | $182^{\circ} 15'$ |
| 2-3 | $174^{\circ} 15'$ | $354^{\circ} 00'$ |
| 3-4 | $223^{\circ} 00'$ | $042^{\circ} 45'$ |
| 4-5 | $166^{\circ} 30'$ | $346^{\circ} 45'$ |
- Determine which of the stations are affected by local attraction and how much? Also determine the true bearings of the lines if the magnetic declination in the survey area is $2^{\circ} 10'E$
12. A) A railway embankment is 10 m wide with side slopes 2: 1. Assuming the ground to be level in a direction transverse to the centre line, calculate the volume contained in a length of 150 m, the control heights at 30 m intervals being 2.50, 3.00, 3.5, 4.0, 3.75 and 2.75 m respectively
- OR**
- B) Perpendicular offsets taken at 10m intervals from a survey line to an irregular boundary are 2.25, 3.85, 4.5, 6.8, 5.2, 7.35, 8.9, 8.3 and 4.45 m. Determine the area enclosed between the survey line and the irregular boundary, the first and the last offsets by a) Trapezoidal rule and b) Simpson's rule?

13. A) It was required to obtain the elevation of the top of a telephone tower located on the roof of a building. Since direct measurement was not possible the following data was obtained. A line AB 135m long was staked out and the horizontal angles to the tower were observed at A as $58^{\circ}30'$ and at B as 30° . At point B a BS of 2.000 m was taken on BM of elevation 100.000 m and the vertical angle to the top of tower was found to be 54° . Calculate elevation of the top of the tower?

CO3 L3 10M

OR

B) Derive the formulae for observations in trigonometric levelling to find the difference in height when they are accessible and inaccessible?

CO3 L3 10M

14. A) i) Explain the Applications of Global Positioning System?
ii) List types of E.D.M and discuss principles?

CO4 L3 5M
5M

OR

B) i) Derive expressions for the horizontal distance and vertical intercept in stadia tacheometry for depressed line of sight, when the staff is vertical
ii) The following readings were taken with a tacheometer on to a vertical staff

CO4 L3 5M
5M

Horizontal distance	Stadia readings
46.5m	0.780; 1.010; 1.240
64.3m	1:.860;2.165; 2.470

Calculate the tachometric constants?

15. A) Classify photogrammetry methods and explain terrestrial photogrammetry.

CO5 L3 10M

OR

B) A section line AB appears to be 10.16 cm on a photograph for which the focal length is 16 cm. the corresponding line measures 2.54 cm on a map which is to a scale 1/50,000. The terrain has an average elevation of 200 m above mean sea level. Calculate the flying altitude of the aircraft, above mean sea level, when the photograph was taken

CO5 L3 10M